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The Journal OF Nervous and Mental Disease

An American Journal of Neuropsychiatry, Founded in 1874

ORIGINAL ARTICLES

ATYPICAL PSYCHOSES AND HETEROLOGOUS HEREDITARY TAINTS

RESEARCHES INTO THE EFFECT OF THE SIMULTANEOUS PRESENCE OF HETEROGENEOUS HEREDITARY CONDITIONS FOR MENTAL DISEASES, HAVING SPECIAL REGARD TO THE QUESTION CONCERNING THE ORIGIN OF ATYPICAL, ENDOGENOUS PSYCHOSES.

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Towards the end of the past, and early in the present century the foundation of the psychiatric systems of to-day was laid. From the variegated picture of psychoses the two large groups of psychoses: the manic-depressive psychosis and the dementia precox group were singled out, especially by Kraepelin. The nuclei of these groups constitute the mainholds of modern psychiatry. A number of cases have, however, continually been met with, which without some distortion do not permit themselves to be diagnostically enrolled in one or the other of these groups. These cases, in various manners, appear atypically. Atypical because they differ from the picture that is generally presented by the psychoses of the two groups mentioned.

The atypical may consist in the fact that the picture presented by a particular disease does not agree with the usual course of the disease: psychosymptomatological dementia precox picture with periodicity, or protracted maniacal or depressive conditions, lasting for years without changes (torpid, chronic melancholias), or it may consist in the fact that a particular picture presents a final stage different from the one that is generally seen: dementia precox with recovery, manic-depressive attacks finally passing into "dementia."

More frequently, however, the striking fact is that a psychosis, the main symptoms of which one would consider as belonging to one of the groups, we find interwoven with symptoms which we are otherwise accustomed to find in the psychoses of the other group, *e.g.*, manic-depressive psychoses with markedly paranoid delusions, ideas of physical influences, with negativisms, stereotypies, catatonic excitement, autistic inclinations, etc., or dementia precox cases with changeable moods, distractibility, flight of ideas, etc.

As to the nosology or conception of such cases there has not been any agreement. As to the cause of their coming into existence, their unusual picture, their unusual course, or unexpected end, the absorption in purely clinical research has not procured any definite or generally recognized results.

On the basis of the modern heredity researches the question concerning these atypics has been taken up for further treatment. After the knowledge of the Mendelian Principles having made its way in psychiatry, especially through the works of Rüdin and Lundborg, the ideas of hereditary polymorphism and transformation were gradually abandoned, and the ideas of separate and homologous inheritance of the tendencies to the two types of psychoses, and, possibly, also to genuine epilepsy, were adopted. As to this see for instance: Albrecht, Davenport and Weeks, Foerster, Frankhauser, Hoffmann, Jolly, Kahn, Riebeth, Rüdin, Vogt, Vorster, Wiedørø, Wimmer, Witterman.

Generally speaking, dementia precox is now presumed to be recessively hereditary (Elmiger, Jolly, Hoffmann, Lundborg, Rüdin, Wimmer, Zoller). Kahn, however, conceives of a recessive as well as a dominant factor.

Manic-depressive psychoses are presumed to be hereditary in some dominant shape (Hoffmann, Jolly, Rüdin, Wimmer, Wittermann *a. o.*); lately Rüdin has advocated the view that some of the hereditary factors might also be recessive, after all. Epilepsy seems mainly recessive.

On the basis of these views new light has been thrown on clinical research. While, formerly, it has only been ventured vaguely and cautiously to ask, whether atypical psychoses might not, after all, be due to a combination of heterogeneous hereditary conditions (Pilcz, Berze, Bleuler, Stransky, Riebeth, Mollweide, Ringbom, Anglade and Masselon, Thenel, Schuppius, Wiedørø, Gadelius), the question and the task have now been definitely set up: What is the phenotype like in the person who carries in him, at the same time, tendencies to several of the aforesaid sufferings, or the constitutional character-

istics, cyclothymic-cycloid, schizothymic-schizoid, which possibly group round the psychoses? And that these phenotypes are largely atypic has been maintained with considerable energy in later years (Rüdin, Boven, Lange, Vorkastner, and, especially, Hoffmann, Kahn, and Kretschmer).

The object of the present thesis is to gather a material for a valuation of these hypotheses. And instead of starting from the bearer of the atypical psychosis, as has generally been the method applied, and examiningly endeavoring to penetrate into the line of ascent of the person concerned, it is here attempted to find crosses between persons with, respectively, manic-depressive psychosis and dementia precox, or, at any rate, between members of families in which the different dispositions—verified by psychoses—appeared separately. This especially holds true of the first chapter. This chapter is made up of 10 family groups affected with convergent heterologous hereditary taints. In the two first groups both parents are psychotic, they have manic-depressive psychosis and dementia precox, respectively. This first chapter is supposed to bring in view directly how the results will be, when the heterogeneous tendencies meet. If the hypotheses are correct, one would expect to find the atypical psychoses particularly abundantly represented among the offspring thus produced by a crossing between differently tainted families.

The second chapter of the thesis deals with nine families. In each of these a child of a manic-depressive father or mother has ended in a schizophrenic mental state. These families have been included on the ground that, if it is right that combined dispositions produce atypical psychoses, and that the manic-depressive disposition may be traced in a dementia precox, we must expect to find atypical psychotic pictures richly represented among schizophrenic descendants of persons with manic-depressive psychoses.

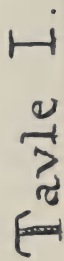
For further particulars see: Chapter II.

CHAPTER I

CONVERGENT HETEROLOGOUS HEREDITARY TAINTS

Family Group No. I, Pedigree I. In a family of four, consisting of two sisters and two brothers, Nos. III, IV, V, and VI in the pedigree, a disposition to manic-depressive psychosis and dementia precox is transmitted through the father and the mother, respectively. The father, No. I, was subject to a melancholia,¹ and committed

¹ Detailed records of diseases in my book: *Atypiske Psykoser og heterolog Belastning*. København, 1924. Levin & Munksgaard, publishers.



Tavle I.

suicide when twenty-seven years of age. In the mother, No. II, a typical dementia precox developed in the years after the death of her husband. She stayed for almost 30 years in a mental hospital. A sister of the mother (No. VII), also had a psychosis, schizophrenically tinged. Another sister of the mother committed suicide, a third presumably suffered from epilepsy. An uncle of the father (his mother's brother), No. IX, was psychotic for many years.

The four sisters and brothers, III, IV, V, and VI, the issue of the convergent dispositions, all became psychotic in their early youth. The elder sister, IV, committed suicide during an acute psychosis, only thirteen years of age. Further details with respect to her are not known. The younger sister, VI, developed a typical manic-depressive psychosis. She has twice been in a mental hospital because of this, in a maniacal state. Between the two stays she was subject to an attack of depression with attempts at suicide. She has been well since 1906. The elder brother, No. III, became psychotic at the age of eighteen. After his having been ill for nine months, there was a remission of about one year, thereupon he was again psychotic during the following 18 years, till he died. During both periods of the disease he was in a mental hospital. The picture was typically schizophrenic. The younger brother, V, also became obviously psychotic at the age of eighteen. Already before that time he was, possibly, periodically "melancholy." In two periods—together for about ten years—the has been an inmate of a mental hospital. The psychosis has been peculiar, variable with respect to intensity and the character of the symptoms; the end presumably schizophrenic—he is still ill—and possibly schizophrenic features have also been traceable throughout the psychosis, as he has been eccentric and affected in his conduct, grimacing, somewhat stereotypic, partly reluctant and sitophobic. He has hallucinated, felt himself haunted by the devil and by ghosts that worried him during his work, etc., but several times there have been markedly depressive periods with crying, self-reproaches, and self-depreciation, and during these periods the schizophrenic symptoms—if present—have not been conspicuous to any considerable degree. Several times there have been periods with changes to laughter and tomfoolery, but then partly with retention, of silence, sitophobia, and reluctance.

Thus we have in the aforesaid family of four children: two sisters and two brothers, all psychotic:

One sister psychotic, committed suicide. Further diagnosis not possible.

One sister with a typically manic-depressive psychosis.

One brother with dementia precox; psychosymptomatologically

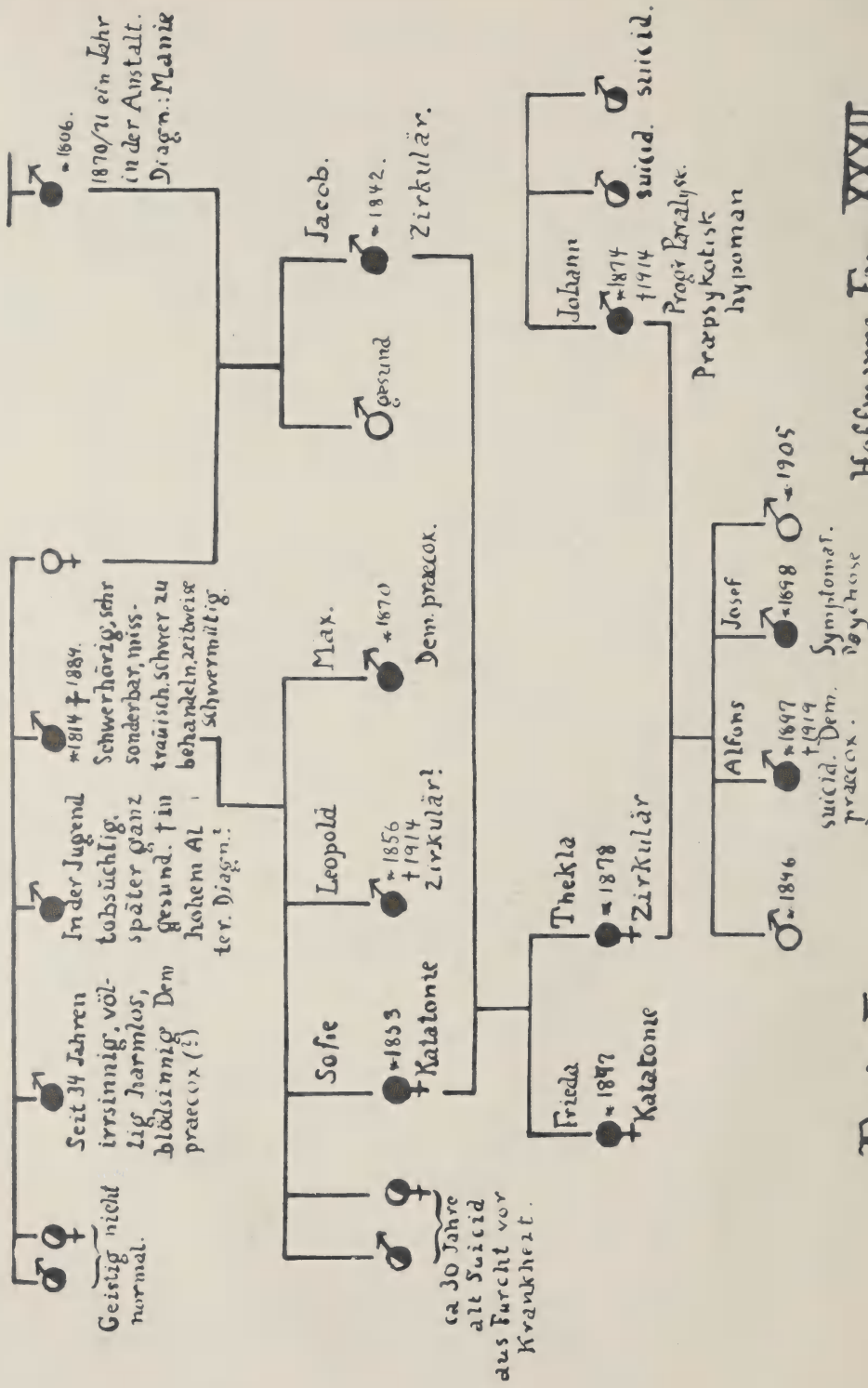


Table II

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pure. Early in the psychosis a remission of about one year. The case is, however, not considered atypical.

One brother with atypical psychosis. Phases characterized by moods, but, possibly, with a schizophrenic sub-soil, and, presumably, schizophrenic final state.

Family Group II, Pedigree II. Hoffmann's Family XXXII. (Only the facts that are of direct interest here have been taken into consideration.)

The two sisters, Frieda and Thekla (the youngest generation but one), have a father, Jacob, who has a manic-depressive psychosis, as also his father had. They have a mother, Sofie, who by Hoffmann is considered typically catatonic; she had, however, already at the age of sixteen an attack of "Verfolgungswahn mit Zerstörungsucht," while her actual psychosis did not commence until she was about twenty-four years of age.

The two sisters, Frieda and Thekla, who are thus tainted both manic-depressively and schizophrenically, both become psychotic. Frieda developed a psychosis, which after several manic-depressive looking phases terminates in a typical catatonic final state. In other words a psychosis somewhat like the "Urstein psychoses." Thekla has a manic-depressive psychosis. The mother's brothers, Leopold and Max, both had rather peculiar psychoses; both remitting, but presumably both ending schizophrenically. For further details *cf.* the pedigree.

Thus, as the result of convergent dispositions: Two women, both psychotic.

One of them: manic-depressive psychosis; the other: atypical. The psychosis beginning manic-depressively, but ending catatonically.

Family Group III, Pedigree III. In a very large family, of which only some members have been indicated—in the middle and to the left—in the pedigree, there is a family of eleven children (in the middle of the pedigree, the eldest generation but two; in this connection the parental generation). Among these eleven sisters and brothers there are two psychotics. One of these, a woman, is an epileptic; but further particulars with respect to her are not known. The other, No. I, a man, is object to a typical dementia precox. For more than 40 years he has been an inmate of a mental hospital. Neither of these have any issue. One of their brothers has a grandson (his son's son), V, who has a pure dementia precox. No new disposition is known to have been added in this case. Two other brothers of No. I marry women, one of whom, b. 1798, d. 1877, is described as being circularly depressed; the other, No. VI (to the right in the pedigree),

has a psychosis, the nature of which cannot be definitely ascertained on the basis of the hospital records, but the patient is a member of a family in which, otherwise, only manic-depressive psychoses have been met with.

As the result of these connections in the first case:

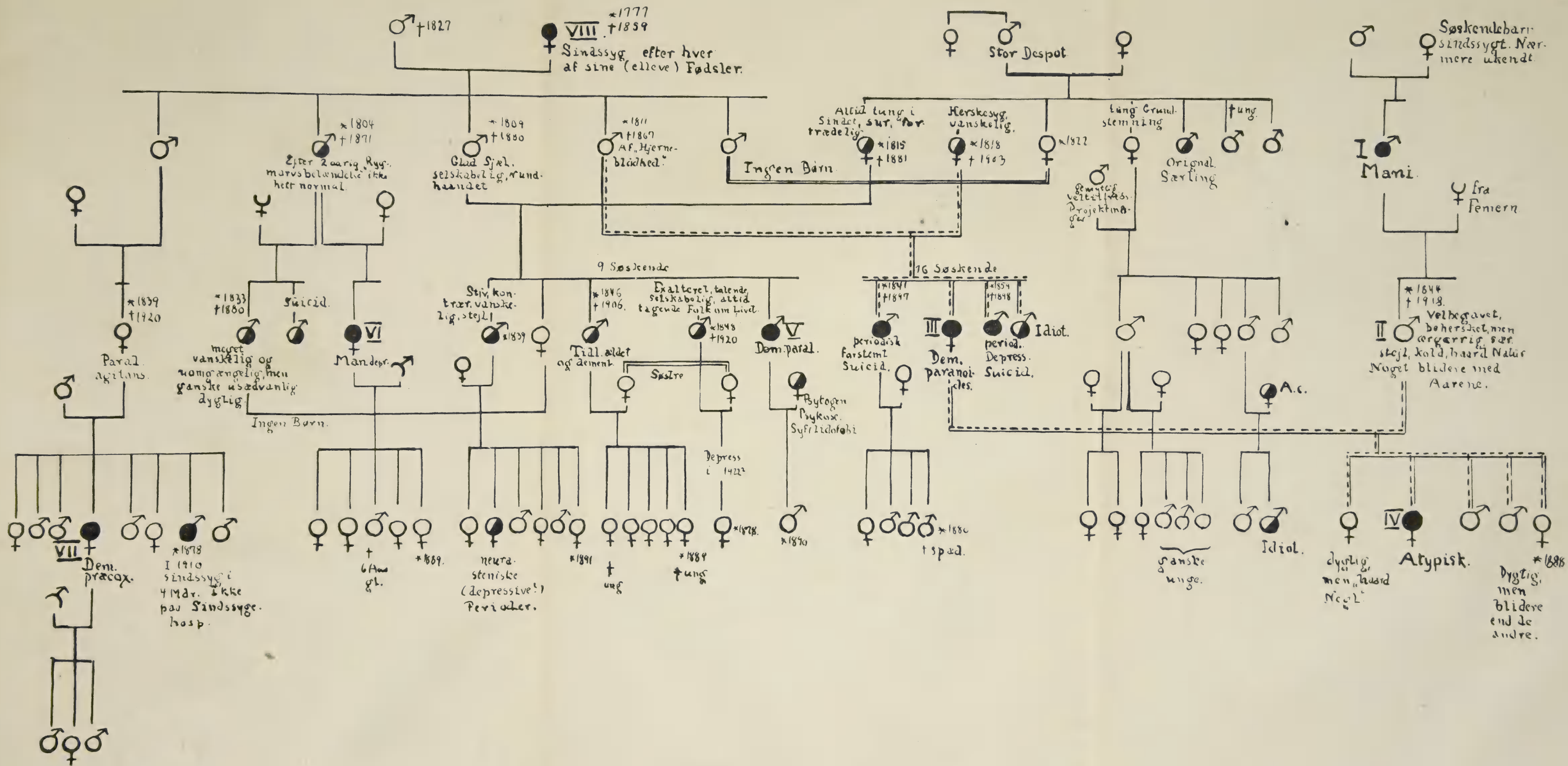
A son, No. II, who extrapsychotically presumably is schizoid, but has a curable depressive though paranoically tinged psychosis. He marries a woman with a manic-depressive psychosis (No. III; to the very left in the pedigree). By this marriage a daughter, No. IV, with manic-depressive psychoses, one of which, however, includes a schizophrenic-looking stupor, lasting for two years.

In the second case no psychoses occur in the first generation of descendants, comprising five sisters and brothers. The eldest of these, a man, has, by a woman who is not known to have any tendency to mental disease, a son, VII, and a daughter, VIII (the youngest generation but one, in the middle of the pedigree), who have both ended in the final phases of a dementia precox psychosis. The son's psychosis in the beginning was somewhat oscillating, showing periods with high spirits, energy, and self-reliance. The daughter's psychosis in the beginning was tinged with depression, with self-reproaches and self-accusation; including a brief remission.

Another brother, IX, among the said five sisters and brothers, marries into the same manic-depressive family of which his mother, VI, was a member. (His wife's sister, XI, has a manic-depressive psychosis.) None of his children are psychotic. A son of his, No. XII, marries into a possibly manic-depressively, possibly "degeneratively" tainted family. (Psychosis in XIV.) As the result of this connection a young girl, XV, who for the present seems to have been landed in a schizophrenic stupor; the beginning of her psychosis has in two periods been markedly depressively tinged. During the psychosis she has moreover been subject to epileptic attacks.

The branch of the large family indicated in the middle of the pedigree, the branch which we in the above have taken for our starting point, thus appears to be schizophrenically—and possibly epileptically—tainted. As the result of marriages into manic-depressively tainted families, or some other manic-depressively tainted branch of the same family, psychoses with mixed pictures appear in five of the descendants. In Nos. II and IV the psychoses ended in recovery; but had partly, or at certain times schizophrenic characteristics. No. II seemed also extrapsychotically schizoid. In Nos. VII, VIII, and XV, the psychoses have ended in schizophrenic conditions, but at their beginnings there have been manic-depressive-looking phases.

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Family Group IV, Pedigree IV. A very large family, in which manic-depressive psychoses are found, but also—partly owing to marriage into another, schizoidally tainted, family—schizoid persons, and a woman, III, with a marked dementia paranoides. (To the right of the middle of the pedigree.) This woman is married to a schizoid man, II, whose father, I (to the right in the pedigree, the eldest generation but one), went through a typical mania, but otherwise had schizothymic, as well as cyclothymic characteristics. By the aforesaid marriage a daughter, IV, with a periodic psychosis (free intervals of up to seventeen years), of a very atypical nature. At times it presents a markedly manic-depressive picture—depression, or high spirits, sportiveness, etc.—but at other times a markedly catatoniform one, with whole catatoniform periods: monotonous, stereotypic, motor unrest, unceasing but monotonous and quite incoherent talk and sound-associations; indistractibility, reluctance, filthiness in her habits, emotional dullness; ideas of influences, hypnosis, electrification. Again, at other times the symptoms of the two kinds of psychoses are interwoven: jollity, sportiveness, talkativeness, but then incoherence, perseveration, verbigeration, monotonous stereotypic unrest.

Thus: Periodical psychosis (three stays in mental hospitals, the last of which lasted for five years), with manic-depressive, as well as schizophrenic symptoms, partly alternating, partly present simultaneously.

Family Group V. In this family in which manic-depressive psychoses occur, a man, who is not psychotic, but whose brother and brother's son have manic-depressive psychoses, marries a near relative. She is either the daughter of his sister or of a cousin of his. In addition to the manic-depressive disposition, which might be common to both parties to the marriage, she, who is not psychotic herself either, but dies at the age of thirty-two, is tainted through her father, who belonged to another family and was psychotic during the last thirty years of his life. A brother of hers, and the brother's granddaughter, have psychoses with symptoms belonging to the dementia precox group. By the aforesaid marriage there are four grown-up children, who may thus be manic-depressively, as well as schizophrenically, tainted.

Of those children, who are all women, two remain mentally healthy. Of the two others one gets a dementia paranoides with monstrous, grotesque delusions and an always foolishly jovial mood; the other is an always heavy and suspicious person, who develops four attacks of a markedly depressively-paranoic psychosis (markedly per-

secutory ideas), which are most strikingly interpreted as aggravations of her daily condition.

Family Group VI, Pedigree VI. In a family of seven children, among whom the sisters VII and VIII (the youngest generation in the pedigree), tendencies to both dementia precox and manic-depressive psychoses, as well as epilepsy, are possibly transmitted through the parents. In the mother's family there are several instances of manic-depressive psychoses. Thus: Nos. IX, X, and XI. As to the father's family, we find the following: No. I, a brother of the father's mother was subject to a dementia precox; was for ten years an inmate of a mental hospital. The father's mother, II, was psychotic; further particulars with respect to this case are not known, however. The father himself, No. VI, was an always shy, solitude-seeking, very neat man, who was inconvenienced by fixed ideas and involuntary misgivings, obsessions, which gradually assumed almost quite grotesque shapes and dimensions. Schizoid? The father's brother, V, in his younger days was a sprightly sociable person; later on he suffered from attacks of depression. Otherwise he was a typical bachelor, finical, neat, and particular. He committed suicide during an attack of depression at the age of sixty-seven, after seven years' stay in a mental hospital. A sister of the father, IV, is a subject to a marked epilepsy; the other sister, III, is a peculiar, but very skillful person.

In the aforesaid family of seven children, the youngest generation, the sister, No. VII, is subject to an epilepsy of the usual type, and inherited, as epilepsy is generally inherited, collaterally, father's sister, brother's daughter. The other sister, No. VIII, has a very remarkable psychosis. It is composed of mood anomalies—several markedly depressive periods, interwoven, however, with a quite extraordinary anger, generally displayed in fits with an exceedingly marked hot-headedness and ill-nature—and of symptoms of a different character: ideas of physical interferences, of being influenced by electricity from the ceiling, of having poison in her food, so that it makes her shiver. She has ideas to the effect that somebody has designs on her, that her hair and her sheets are besprinkled with something. She hallucinates, hears a mocking laugh, when she is worried. So far manic-depressive-looking elements, moreover ideas of influences, sensations, and delusions, the picture of which seems schizophrenic, if anything, and furthermore a hot-headedness and a violence which, in view of the disposition at hand, might induce one to think of the effects of a possible epileptic tendency.² For this

² A case of three kinds of hereditary taints is also found in the works of Kahn.

presumption we have a further hold in the fact that she shows dysregulation according to the Hasselbalch-Bisgaard formula.

Family Group VII, Pedigree VII. This group consists of a whole series of intermarried families, all with psychic variations or psychoses. What is thought to be of interest in this case is the nature of the psychoses that occur every time when two differently "tainted" families meet. The psychoses that in this group might be due to dispositions brought together in this way are Nos. IV, VI, VIII, and IX. (From the left to the right in the pedigree.) In the instance of the three last-mentioned persons, however, it is just as probable that it is schizophrenic tendencies from both sides that meet. Furthermore Nos. XIII, XVIII, and XXIII.

No. IV, a man, is subject to a dementia paranoides without any particularly atypical characteristics.

No. VI, a man, is a psychopath. Vagabondizes. Commits thefts.

No. VIII, a man, and No. IX, a woman (brother and sister), have typical dementia precox.

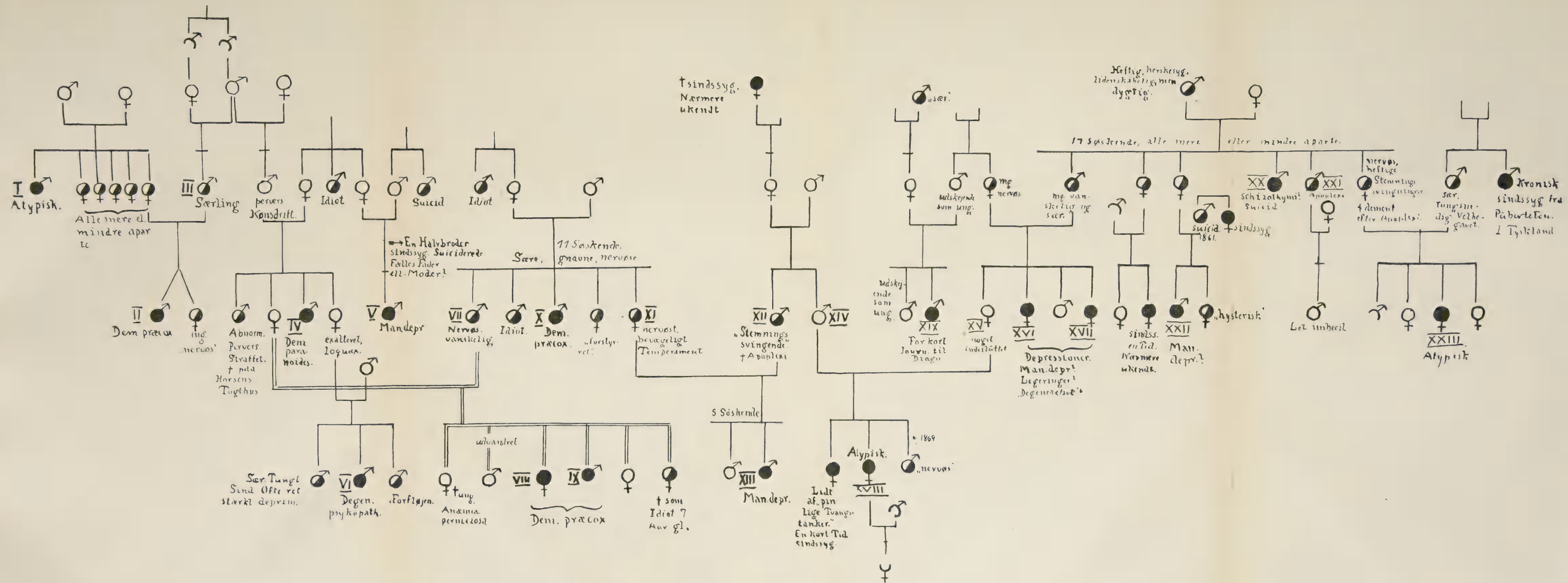
No. XIII, a man, is the issue of a connection between a woman of a schizoid-schizophrenic group of sisters and brothers and a man of variable moods. No. XIII is of a soft and emotional temper, passes through two slight attacks of depression, has no schizophrenic characteristics.

No. XVIII, a woman, is on her father's side of the same family as No. XIII; in other words possibly cyclothymically tainted; on her mother's side she belongs to a family with "compound" psychoses, which perhaps already here have come into existence as the result of united manic-depressive and schizoid-schizophrenic tendencies, possibly are a kind of "degenerative" psychosis as such. No. XVIII passes through two brief periods of depression, symptomatologically quite simple. Six years after the latter period she again becomes psychotic, and passes into a schizophrenic state in which she remains till she dies from an accident four years later.

No. XXIII is, on her mother's side, a descendant of the same family as XVIII; in other words she has the same composed or degenerative disposition. Her father is peculiar and heavy, her father's brother chronically psychotic from puberty. Probably he had a schizophrenic psychosis. No. XXIII passes through a schizophrenically tinged psychosis, which, however, at the beginning showed a remission of six years.

In summing up I shall—cautiously—confine myself to considering the psychoses XIII and XVIII. This group forcibly illustrates with what an almost alarming regularity psychoses occur, when two

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individuals, tainted through near relatives, give birth to any issue when united.

Family Group VIII, Pedigree VIII. A series of eight sisters and brothers (the eldest generation but one), probably inherit from their parents, Nos. II and III, two or more heterogeneous psychotic tendencies. Concerning the mother, II, her sisters and brothers, or ascendants, we have no particulars, but a nephew of hers, her sister's son, No. I (to the left in the pedigree), has a schizophrenic-looking psychosis, possibly with a sub-soil of emotions and fluctuating moods. The father, III, is melancholy, makes several attempts at suicide. A brother of his has a granddaughter (his son's daughter), No. IV (to the right in the pedigree), who has a degenerative, variable psychosis, especially characterized by partly fantastical and megalomaniacal confabulations.

Thus schizophrenic, as well as manic-depressive, and perhaps also special degenerative tendencies are possibly transmitted to the children by II and III.

Of the eight sisters and brothers two have psychoses. One of those, a sister, VI, has a pure, manic-depressive psychosis; the other, a brother, VII, a symptomatologically schizophrenic psychosis, which, however, has only been under observation for about one year. No. VI, and two others of the said sisters and brothers, who are not themselves psychotic, have among their children psychotic persons. Thus No. VI has a son, VIII, whose psychosis—he has now been psychotic for twenty-odd years—soon passed into, and has terminated in, a schizophrenic state. At the beginning, however, it seemed intermingled with manic-depressive characteristics: emotional, fluctuating moods, exaltation, flight of ideas, distractibility, and later on depression, self-reproaches, ideas of his own unworthiness, etc. A brother of No. VI has a daughter, No. IX, also showing symptoms of a schizophrenia, as well as a manic-depressive appearance. Furthermore another brother of No. VI, No. XI, has by a schizophrenically tainted woman a daughter, XIV, with a "degenerative" psychosis. Finally we find in the youngest generation a young woman with catatonia—to the left in the pedigree—which disease perhaps at its very beginning, before the girl was confined in a mental hospital, showed manic-depressive characteristics.

Further concentrated: On the basis of united heterogeneous tendencies the following psychoses have occurred in this family:

Women: No. VI: a pure, manic-depressive psychosis.

No. IX: mixed psychosis; at first chiefly characterized by moods,

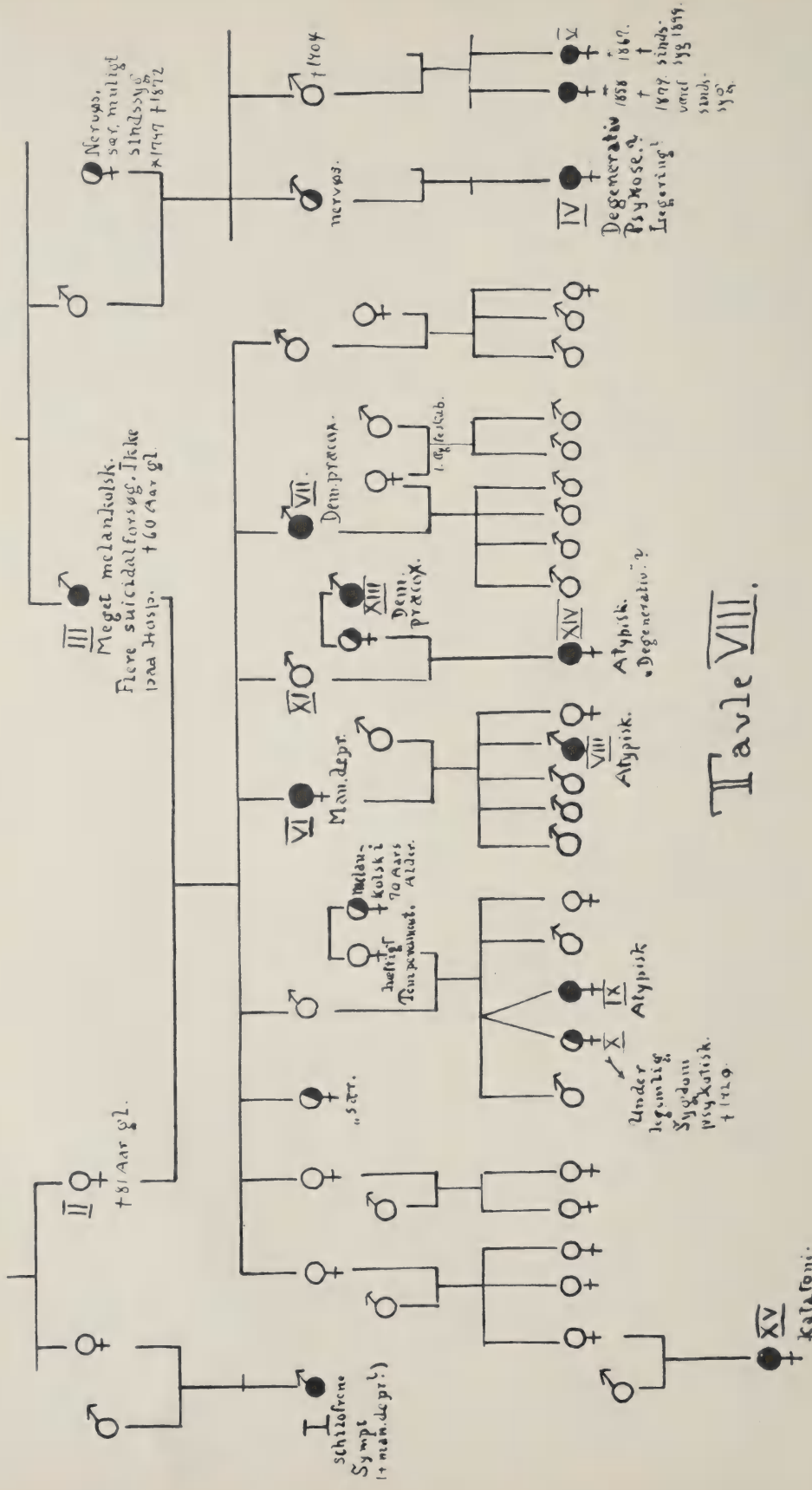


Table VIII.

and with a brief, transitory attack of depression as precursor; later on chiefly schizophrenically tinged.

No. XIV: degenerative, variable psychosis; cannot be definitely rubricated.

No. XV: catatonic psychosis; rather pure in its later course, possibly with a quite brief, manic-depressive-looking period at its beginning.

Men: No. VII: purely schizophrenic-looking psychosis.

No. VIII: schizophrenic psychosis; at the beginning intermingled with manic-depressive characteristics, present simultaneously with the schizophrenic ones. No fluctuations in the course of the disease.

Family Group IX. Pedigree IX. A woman, No. I, who has a circular (manic-depressive) psychosis, and her early "fatuous," later on psychotic, husband, No. II (the eldest generation), in all likelihood transmit to their descendants manic-depressive and non-manic-depressive, but possibly schizophrenic tendencies, respectively.

In the first generation of descendants, consisting of six sisters and brothers, there is at least one, a woman, No. III, who as psychotic has been admitted into a hospital. Her psychosis was, as far as the record goes to show, a purely manic-depressive psychosis.

In the second generation of descendants there are three men and a woman who have been in mental hospitals. One of these, a man, No. VI, with a purely manic-depressive psychosis. A man, XI, and a woman, VII, with purely schizophrenic-looking psychoses. Furthermore a man, X, suffering from general paralysis, with a somewhat periodically fluctuating mood.

In the third generation of descendants three women in asylums. One, No. XIII, with a typical dementia precox. Two women, XX and XXI, are marked degenerative psychopathic types: amoral, dissolute. Both show some periodicity, in the instance of No. XXI of a somewhat cyclothymic character.

Finally in the fourth generation of descendants there is a young man, XVI, with a typical dementia precox, and a young woman, XV, with a soon lethally developing catatonia.

Thus of all these, who might have combined dispositions (the case with paralysis excluded):

Two have psychoses of a purely manic-depressive character: *viz.*, No. III, woman, and No. VI, man.

Five (two men and three women) have psychoses of a purely schizophrenic character: *viz.*, Nos. VII, XI, XIII, XV, and XVI.

Finally we find two degenerates, who for the present cannot be rubricated with certainty; both show some periodicity, in the instance

of one of them of a somewhat cyclothymic character, but with the amorality characteristic of the schizoids, which was possibly also found in No. XIX, the mother of the two persons concerned.

Thus in this family there is a great majority of "pure segregation."

Family Group X, Pedigree X. To a series of sisters and brothers, among whom Nos. V, VI, and VII (the youngest generation but one), several heterogeneous tendencies to psychoses have probably been transmitted by the parents, Nos. I and II. One of these taints has presumably been of a manic-depressive character, and it is possible that it has come either through the mother or through the father, or through both. In her early youth the mother, I, had a psychosis, which was melancholiform, and may have been of a manic-depressive character, but also may have been of an exogenous nature, as it arose during—and continued after—a chorea minor. A sister of the father, No. IV, had a manic-depressive psychosis. From the father's side also a tendency to epilepsy may have been transmitted to the descendants. The father's sister, No. III, was an epileptic. The father himself also suffered from convulsions, but he was an alcoholic, so that his convulsions may have been of an alcoholic nature. Schizophrenic tendencies do not seem to have been ascertained in the ascending line.

In the aforesaid series of sisters and brothers a sister, V, and a not hospitalized brother seem to have purely manic-depressive psychoses. Another sister, VII, also has a manic-depressive psychosis, but this is, in its maniacal phases, rather remarkable by an extraordinary recklessness and aggressive irascibility.

This to a still higher degree holds true of her daughter, No. VIII (*i.e.*, in the second generation of descendants), who, besides periods of purely maniacal excitement, also displays states of mind characterized by a peculiar dimness, in which she wanders about restlessly, silent, sleepless, and sometimes impulsively aggressive. The psychoses of the two latter persons, mother and daughter, may be conceived of as being tinged by a possible epileptic disposition.³ The daughter, however, is orthoregulant after the Hasselbalch-Bisgaard formula.

In the first generation of descendants there is, besides the aforesaid persons, a brother, VI, with a purely schizophrenic psychosis.

Recapitulation: As the result of convergent heterogeneous taints, of which the manic-depressive and the epileptic disposition have been

³ Similar states of mind are mentioned by Lange.

more particularly pointed out, we find in the first generation of descendants among seven grown-up sisters and brothers:

A woman with a purely manic-depressive psychosis, and a woman with a manic-depressive psychosis which, however, is characterized by a possibly epileptic irascibility in its maniacal phases. Furthermore a man, who is cyclothymic, and a man, who has a pure dementia precox.

In the second generation of descendants a woman with a manic-depressive psychosis, perhaps interwoven with epileptic characteristics (she is, however, orthoregulant), and a woman with a, presumably, manic-depressive psychosis, which, however, has also been remarkable by the displaying of a violent temper and easily-arising agitation.

SUMMARY OF CHAPTER I.

Several series of sisters and brothers are tainted from the side of either parent, either in such a manner that both parents are psychotic and have heterogeneous psychoses, or in such a manner that one of the parents is psychotic, while the other parent has a psychotic father or mother, sister or brother, whose psychosis is of a different nature from that of the former parent, or finally in such a manner that both parents have psychotic sisters or brothers or parents. (In a few cases, however, tainting through somewhat more distant relations has also been taken into consideration.)

Thus the aforesaid series of sisters and brothers are to be regarded as the first generation of descendants. Also in the following generations of descendants a number of psychoses occur.

In the first generation of descendants, among sixty sisters and brothers, of whom, to be sure, some are so young yet that they might get psychoses later on, we find twenty persons who on account of psychoses have been in mental hospitals. Fourteen of these twenty are women, six men; five women and one man have purely manic-depressive psychoses. One woman and three men suffer from pure dementia precox—altogether ten persons. Thus half the psychoses appear to be pure and purely segregated. The other half, the remaining ten, show, to a larger or smaller extent, symptoms pertaining to the two or all three kinds of psychoses, as mentioned above.

In the following generations of descendants altogether seventeen psychoses occur, six in men, eleven in women. Seven of the psychoses are pure. There are three men and three women with dementia precox and one man with a purely manic-depressive psychosis. The remaining ten psychoses are atypical in various manners, as stated above.

Numerically, of course, one cannot draw any definite inferences from the material at hand, but apparently it goes to show that (1) series of generations descending from two persons who bring together heterogeneous tendencies to psychoses come to present a considerable number of psychoses; that (2) these psychoses will partly be of a pure type, as the phenotype of the originally separate dispositions, partly show combinations of the heterogeneous phenotypes; and that (3) the atypical phenotypes occurring in the more distant degrees of relationship (when the heterogeneous tendencies have once been united), also appear among descendants of apparently sane persons, and without addition of any new hereditary taints.

CHAPTER II

Manic-depressive ascendants with descendants ending in a schizophrenic state, but without any schizophrenic tainting having been ascertained.

As mentioned above these cases have been included as supplementary to the preceding researches. If dementia precox and manic-depressive psychosis are due to different, mutually independent hereditary tendencies, dementia precox occurring in a descendant of a manic-depressive and not psychotic person, must be due to hereditary factors that have been concealed under the manic-depressive and the healthy—not psychotic—phenotype. But as the descendant of a manic-depressive person we must, in these cases, expect that the schizophrenic person concerned will often be the bearer also of a manic-depressive hereditary character or parts of same. And if it is right, what has been set forth in theory, that combined hereditary characters result in atypical psychoses, we must, consequently, here again be justified in expecting to find mixed, atypical psychosis pictures among the schizophrenic descendants of manic-depressive persons.

The following cases have been selected on the basis of the final state of the descendant. By this mode of proceeding those cases (among the descendants) are not taken into account, which may have proved atypic in such a manner that they, psychosymptomatologically, have been of a schizophrenic character, but, after all, have terminated in recovery. If the hypotheses are to hold true, the cases under consideration must to a certain extent prove atypic in such a manner that they either show a course that is unusually fluctuating for dementia precox, or are found interwoven with manic-depressive symptoms, or possibly unite both these peculiarities.

FAMILY GROUP XI

The following material is: A young man, No. I, is through his mother's mother and his mother tainted with epilepsy and manic-depressive psychosis. His mother's mother was an epileptic; the mother had a marked manic-depressive psychosis; between her fifteenth and her sixty-seventh year she passed through a series of attacks of same; ten times she was confined in a mental hospital on that account; at times she was exalted, again depressed. The psychosis, however, was perhaps slightly hysterically tinged, with theatricality and affectation. Among the mother's sisters and brothers two men had manic-depressive psychoses, a woman was an epileptic.

No. I became psychotic at the age of seventeen, and has since then been in a mental hospital, now for 18 years. His psychosis has ended in a schizophrenic state. He is foolish, stereotypic, verbigerating, uninterested, grossly filthy in his habits; but the psychosis has shown certain fluctuations, which have approached those of the manic-depressive phenotype, as the patient has, in certain periods, shown motor unrest, has been more laughing, frolicsome, but unproductive with respect to speech, or slightly depressed. He has not been typically schizophrenic. He shows dysregulation of the Hasselbalch-Bisgaard formula.

One might now ask, whether in a case like the present it is any question at all of a really "genuine" dementia precox. Is it a dementia precox, the slight, periodical deviation from the type of which is due to a present manic-depressive or (the dysregulation) epileptic disposition; or is it not—as a matter of fact no schizophrenic tendency has been ascertained in the ascending line—a nonschizophrenic psychosis, the phenotype of which only highly resembles dementia precox? The idea and observation that the epileptic disposition together with a manic-depressive one came to "work" as a schizophrenic disposition have formerly been advocated, I think by Hoffmann. Perhaps the regulation researches here may be of some use in future researches. As it will be remembered, already in Family VI a patient, No. VIII, was found who, besides a complicated phenotype, showed dysregulation. (She was also epileptically tainted.)

FAMILY GROUP XII

At the age of twenty-one a young man gets a psychosis. This is in its whole course—it has now lasted for thirteen years—schizophrenically tinged; but at its beginning there was a rather good remission of a little more than two years, during which the patient was able to fill situations in life, although, after all, he was a little peculiar all the

time. I do not consider this psychosis atypical. Two sisters of the patient has manic-depressive psychoses. The mother of these persons, from her thirtieth year, until she died at the age of forty-five, passed through a series of psychotic attacks. These are chiefly manic-depressively tinged. During one particular attack she was depressed, thought herself damned, lost; during the other attacks her condition was characterized by high spirits, sportiveness, tomfoolery, distractibility, flight of ideas, etc. Between the early attacks she seemed to have recovered completely, this is hardly the case between the later attacks, following very quickly after each other. But certain features of the psychosis are not quite typical of manic-depressive psychosis. During the first as well as during the later attacks there are manifestations of suspiciousness, ideas of allusions, espionage, plots. Somebody is on the telephone, she has sensations in the throat, sees terrible scenes, hears accusations, etc. Against all this she gradually adopts the particular mode of reaction of hiding away, crouching under the bedclothes, and she becomes obscure and absent-minded. And this hiding away quickly changes with periods in which she conveys a rather natural impression. It seems to me that this picture is not quite consistent with the usual manic-depressive pictures, and possibly reactions from dispositions other than manic-depressive ones intervene. A sister of the mother had a manic-depressive psychosis, but hysterically tinged.

FAMILY GROUP XIII

A young woman becomes psychotic about twenty-five years of age. She is received in a mental hospital and dies after a year, from an intercurrent disease. The character and course of her psychosis during the brief time of observation are purely schizophrenic. A twin brother of hers has recently become psychotic. The picture is, at present at any rate, chiefly schizophrenic. The mother of these two persons is an otherwise cheerful woman, who has twice been subject to slight, but typical attacks of depression of a manic-depressive type.

FAMILY GROUP XIV

A young woman of an always rather confined intellect becomes evidently psychotic about nineteen years of age. She is received in a mental hospital, and dies there from tuberculosis four and one-half years later. The psychosis soon gets a purely schizophrenic picture and develops without remissions. At its beginning there seems to have been an addition of hysteriform symptoms, but not so marked that the psychosis cannot be considered typically schizophrenic.

A sister of the patient's after her fortieth year passes through

three psychotic attacks, from which she recovers completely. The attacks are all of an emotional character, but furthermore characterized by a marked perturbation and confusion; it is not easy to form a judgment of them; it seems to be a question of manic-depressive, or possibly "degenerative," pictures, partly perhaps tinged with febrile conditions.

The mother of these two sisters is subject to a series of attacks of psychosis, often occasioned by accidental causes. The symptoms of the attacks are manic-depressive (attacks of depression or exaltation), perhaps with an admixture of hysterical symptoms, "convulsive crying," "spasms," screaming, etc. No schizophrenic symptoms.

FAMILY GROUP XV

A girl of twenty gets a psychosymptomatologically schizophrenic-looking psychosis, which after six months shows a remission of about nine months, but thereupon again becomes more massive, and as regards the latest period has now, without remission, lasted for two years. I do not consider the remission sufficiently marked to feel justified in considering the psychosis atypical.

The mother of this girl has been subject to a series of attacks of manic-depressive psychosis; between and after the attacks she has been well. Her attacks have at times been characterized by exaltation, with chatting, singing, flippancy, or scolding, motorial unrest; again she has been depressed and self-reproaching. During the attacks, as well as in her well periods, her behavior has been characterized by a certain reservation and unapproachableness; she has moreover hallucinated to a rather marked degree, also apart from the marked mood phases; but any symptoms really characteristic of a "nonmanic-depressive" type have not been ascertained.

The grandmother of the said young woman (*i.e.*, her father's mother) had a typical attack of depression. Furthermore, several other psychotics have been present in the family: the mother's sister, mother's father, mother's father's brother, mother's mother's sister. But further particulars with respect to these cases have not been procurable.

FAMILY GROUP XVI

A woman, who has always been unreliable and mendacious, but suspicious as well, is received in the hospital at the age of seventeen, twenty-two, and thirty-seven, respectively, on account of mental derangements. During these three admissions she has shown symptoms of a decidedly hysterical character: wailing, uneasiness, anxiety on account of terrifying optical delusions: cats on the walls, serpents

in her bed, etc. She also evidences very marked suggestibility. Somatically she shows hysterical symptoms, as analgesias, etc. At the age of thirty-nine she again entered the mental hospital, but this time the picture differed from those presented in the earlier episodes, and she passed into a decidedly schizophrenic state. She was dull and a sottish mood. She showed lack of interest, stereotypies, and mannerisms, and for years she sat rocking arm in arm with another patient. She molests herself, notwithstanding the same indifferent, flatly fatuous mood. Her condition was unaltered for fifteen years. Atypical.

A brother of hers is also psychotic. He shows partly "degenerative" symptoms: inconstancy, vagabondages; partly manic-depressive-looking exaltations and depressions, and partly schizoid-schizophrenic symptoms. He had almost systematized paranoid ideas, hallucinations, and ideas of influences which were explained and described with neologisms, but altogether remitting, activated, and colored by psychical traumata. The psychosis is still developing. Atypical.

The mother of these two persons passed through a series of purely manic-depressive psychotic attacks. The father of the said two persons was a very peculiar, affected, and quick-tempered person. He committed suicide.

FAMILY GROUP XVII

An always rather pessimistic and speculative girl became psychotic about the age of twenty, her psychosis taking the shape of a depression. This remitted for a short time, but at the age of twenty-one she is committed to a mental hospital, and has not been well since. She is now more than sixty years of age. For more than the first ten years the psychosis manifested itself as a depression, somewhat variable with respect to intensity, and to a certain extent characterized by fixed ideas and much reflecting on trifles. About the thirty-third year a rather sudden change took place, during which the psychosis took an undoubtedly schizophrenic course. There were hallucinations, suspiciousness, paranoid ideas, ideas of hypnosis, electrification, influences, sexual abuse, etc. Her ideas become quite grotesque. She has the feeling that her thoughts are being forced and distorted. She becomes reluctant, repulsive; her speech is altered; she uses neologisms on a large scale, becomes incoherent in her way of thinking, uninterested, silent, filthy in her habits. This condition lasts for more than twenty-five years. During the last year her condition has perhaps again to a certain

degree been depressively tinged. There were never any maniacal phases. Atypical.

A sister of hers has passed through three attacks of depression. In these nothing definitely atypical has been ascertained. A brother of hers has a purely manic-depressive psychosis.

The father of these three persons, at an interval of thirteen years, passed through two typical attacks of depression, from which he recovered. A son of the father's sister is imbecile, with manic-depressive fluctuations. The daughter of a sister of the three afore-said persons (the two sisters and the brother) died during a depressive psychosis, the character of which cannot be definitely stated.

FAMILY GROUP XVIII

A woman, who has always been difficult, stubborn, obstinate, and of an unequal temper, after her twentieth year passes through four psychotic attacks. She has not recovered from the last attack, which has now lasted for seven years. There is an interval of four to five years between the earlier attacks. The interval is shorter between the later attacks. As regards the attacks, the first and the four last years of the last one have been schizophrenically tinged; the second and third and the first years of the last attack have contained periods of exaltation with high spirits, frolicsomeness, risibility, dressiness, distractibility, but together with unproductivity, reservation, and reluctance. Mixed states of manic-depressive psychosis? On the whole the psychosis is atypical.

The patient's mother has been subject to a long series of manic-depressive mood fluctuations and psychoses (ten times in hospitals on that account), but furthermore she has been somewhat "obscure" and "hysterical," and has had some fits with loss of consciousness and convulsions. The nature of these cannot be stated with certainty.

Two other daughters of the mother's, step-sisters of the patient first mentioned, have also had psychoses. One of them has been subject to typical attacks of depression, the other to ordinary manic-depressive attacks, but the condition of the latter has moreover been characterized by a certain unapproachableness and an inclination to rather grotesque (partly persecutory) ideas. Reactions from hereditary dispositions other than manic-depressive ones? Both daughters have recovered completely. Their father's mother suffered from senile dementia.

FAMILY GROUP XIX

A woman from her childhood is subject to marked mood-fluctuations of a manic-depressive type. At the age of twenty-two she is admitted to a mental hospital during a depressive phase, but her

condition soon presents schizophrenic features, which gradually become quite predominant. She shows incoherent talk, verbigeration, neologisms, mannerisms, eccentricity, and autism. During the further development this condition is, however, now and then broken by brief maniacal phases. She dies from tuberculosis at the age of twenty-nine. Atypical.

Her mother and mother's brother have suffered from pure manic-depressive psychoses. Her father was possibly a crank. Her father's brother had a manic-depressive psychosis, but was possibly besides the object of psychopathic degeneration, as was his brother's son, whereas the father of the latter, who was formerly hyperthymic, gets a senile psychosis with very predominant paranoid ideas.

SUMMARY OF CHAPTER II

The starting point in this series of researches was the nine persons who, ended in schizophrenic states, had had a manic-depressive father or mother. Two of these nine were purely schizophrenic. Two were psychosymptomatologically likewise purely schizophrenic, but the psychoses showed remissions, which, however, were not significant enough to induce one to surmise the effects of possibly existing manic-depressive hereditary factors. One had a psychosis, the symptoms of which prior to the onset of the schizophrenic characteristics were of a hysterical type and showed no manic-depressive features. The remaining four displayed symptoms partly of a manic-depressive, partly of a schizophrenic character. These four were the persons first mentioned in groups XI, XVII, XVIII, and XIX.

To rely upon statistics, where so few cases are concerned, is of course absurd. It may, however, be noted that among the cases that were held to be pure, there were three in which only a rather brief time of observation was offered, so that it is possible that they had proved less regular, if they had offered a possibility of observation during a longer period.

As regards the manic-depressive parents of these nine persons, there has, in the instance of five of the eight mothers—one of the tainting ascendants was a man—been an addition, as it were, to the manic-depressive symptoms, a certain hysteric or paranoid tinge. Whether these petty traits are of any significance as regards the psychosis of the descendant or the course of same—whether they hint at a possible combined disposition in the mother—cannot be decided on the basis of the material at hand.

RECAPITULATION

Among the psychoses that have occurred when heterogeneous tendencies have been united, and among the psychoses that have ended in schizophrenic states, but have occurred among children of manic-depressive parents, I have—taking it in round figures—in half the cases found certain atypics, phenotypes that may look like combinations of two or three single phenotypes. The other half of the cases have proved pure typical psychoses. This falls in very well with the theories advanced, but the material is not comprehensive enough as yet to be held to contain a conclusive evidence—nor can it easily become so in the hands of one single individual. The atypics have appeared partly as “Urstein psychoses,” the manic-depressive-looking attacks, ending, after all, in a schizophrenic state. Partly we have continuous psychoses, parts of which, however, look like manic-depressive states, or in which the mood perhaps again is traceable after a schizophrenic state of almost thirty years’ duration. We have remitting psychoses, where now the picture pertaining to one group of psychoses, now that of another, seems predominant, or in which one attack is of a schizophrenic, the other of a manic-depressive character. Finally we have pictures through which the epileptic disposition possibly may be traced in the shape of an extraordinary irascibility or peculiar states of obscurity. In two cases, where there was a question of hereditary epileptic taints, dysregulation *ad modum* Hasselbalch-Bisgaard has been stated.

As it appears as if a manic-depressive \times a schizophrenic ascendant possibly will prove to have a larger number of schizophrenic children than a schizophrenic \times a personally sane ascendant, it is finally suggested as a possibility that the manic-depressive and the schizophrenic disposition, after all, are not altogether mutually independent.

The results of the work may be summed up as follows:

If heterologous hereditary characters are united, it will in the descending line entail the occurrence of a considerable number of psychoses, about one-half of which are purely segregated as the pure psychoses of the separate dispositions, whereas the other half present combinations of the various phenotypes in the theoretically imaginable ways.

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ABSENCE OF CORD CHANGES IN A CASE WITH A CLINICAL PICTURE OF DORSAL MYELITIS *

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A colored woman, aged fifty-four, admitted August 24, 1924, to the neurological service of Cook County Hospital, complained of pain in the chest, numbness below the nipple line down to the toes, and loss of weight.

Present Illness. Patient was well until the fall of 1923 when she contracted a severe sore throat and a "bronchial cold." This lasted until January, 1924, when she noticed a "bulging" in the sternum associated with severe pain in the right breast. The pain radiated to beneath the upper half of the sternum and from there to the left breast. It was dull, constant and aggravated by coughing. Five months after the onset of the disease pain was experienced in the upper dorsal region, between the shoulders, and this grew constantly worse. About three weeks prior to the admission to the hospital, the patient began to experience numbness around the umbilicus, radiating to both sides. It was followed by weakness in the knees which increased and in the last two days rendered the patient helpless.

Previous History. Patient denied venereal diseases. Twenty-five years prior to the admission to the hospital she had had a hysterectomy. Except for an occasional "sore throat" and "grippe" she had otherwise always been well.

Family History. This was entirely negative.

Examination. A diffuse symmetrical protrusion in the uppermost portion of the sternum about 8 cm. in diameter rose about 2 cm. above the chest wall. This bulging mass was but slightly tender to pressure, did not pit or pulsate and on auscultation gave no murmurs. Further examination of chest and abdomen revealed no important abnormality.

Active and passive movements in the upper extremities were normal and of good power; in the lower extremities they were markedly diminished. There was slight spasticity, with exaggerated tendon reflexes, especially patellar, bilateral positive Babinski and Gordon phenomena and a bilateral foot clonus. Coördination was good in the upper and somewhat poor in the lower extremities. Kernig and Brudzinsky signs were absent. There were no atrophies or deformities.

Sensibility to pain, touch and pressure was diminished below the umbilicus but the exact areas of sensory disturbances could not be defined.

The pupils reacted to light somewhat sluggishly but well in accommodation. The cranial nerves were otherwise normal as were also speech and mentality.

The blood examination gave a negative Wassermann, 4,100,000 red and 6,400 white cells. The urine showed no albumin but many pus cells.

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Fluoroscopic examination and plates showed a diffuse increase in the aortic arch, absence of tuberculous spondylitis or deformities and a somewhat greater density of the bodies of the third and fourth dorsal vertebræ.

Lumbar puncture was done only once and the spinal fluid contained traumatic blood. Wassermann reaction on this was negative.

Course. The pain spread to the lower extremities and was quite severe. In the shoulders it continued to grow worse with numbness "sneaking" into the hands. Incontinence of the bladder set in September 15, bed sores developed and the patient gradually failing died October 18, 1924. On account of progressive loss of strength a suggested laminectomy for a possible pressure on the spinal cord could not be carried out.

Post-mortem Examination. Metastatic carcinoma of the anterior mediastinal lymph glands (the primary source undetermined); carcinomatous metastases to the sternum and sterno-clavicular joints; carcinomatous invasion of the second and third dorsal vertebræ; thrombosis of the anterior mediastinal veins; embolic occlusion of the branch of the right pulmonary artery; recent infarct of the right lower pulmonary lobe; old subtotal hysterectomy; bed sores in the regions of the sacrum and trochanters; no palpable glands in the axilla or inguinal regions; bulging of the sternum, firm and nodular, beginning at the second interspace. The brain was not removed.

Microscopic Examination. This revealed no evident structural changes in the spinal cord either in gray or white substance. The meninges were in general normal excepting a mild peridural infiltration with lymphocytes and plasma cells around the upper dorsal cord segments. Enormous amounts of amyloid bodies were present throughout the spinal cord, but especially in the dorsal segments where they invaded not only the gray and white substances but also the subpial glia, and to a lesser extent the posterior roots. Longitudinal sections of the spinal cord showed the myelin in some fibers broken up into globules and droplets and somewhat hypertrophied glia nuclei without, however, any marked glia reaction, such as formation of myeloclasts, myelophages or gitter cells. The posterior roots of the upper dorsal region exhibited a marked vascularization—the blood vessels were numerous and markedly hyperemic but not infiltrated. Many showed a hyperplasia of the epineural sheath and of the arachnoid mesothelial cells, the roots appearing enveloped, muff-like, by the proliferated cells of the epineurium and the arachnoid membrane. In addition, small clusters of cells, apparently epithelial, were present within some posterior roots of the upper dorsal region. Such, however, were exceedingly rare. In contrast to such evident changes in the upper thoracic, none were found in the lower thoracic, lumbar or sacral roots. Neither did the meninges or the spinal cord here show anything pathologic, regardless of the staining methods used (hematoxylin-eosin, toluidin blue, Weigert-Pal, Alzheimer-Mann).

Comment. The discrepancy between the clinical and pathologic findings is quite striking. The clinical picture was that of an organic spinal cord lesion in the form of a so-called pressure myelitis. Such a diagnosis was justified by the gradual involvement of both the motor and sensory pathways of the spinal cord, probably by a tumor. The resulting spastic paralysis of the lower extremities

was associated with disturbances of sensibility, trophic lesions and incontinence of the bladder. The history of a hysterectomy suggested the possibility of a carcinoma of the meninges. Yet the most careful search for a meningeal infiltration with carcinoma cells or other meningeal changes such as hemorrhages or thickening failed to reveal such an etiology. The slight peripachymeningitis, or the marked epineural proliferation of the posterior roots with their microscopic cellular infiltrations could not be held responsible for the spastic phenomena that dominated the clinical picture, though they could account for some sensory phenomena such as root pains. The parenchyma of the cord itself, as pointed out, did not appear compressed at any level nor did it show signs of degeneration or inflammation. Absence of pressure, degenerative or inflammatory phenomena in the spinal cord would therefore indicate that neither the lesion of the second or third thoracic vertebræ could explain the clinical picture of a dorsal myelitis. The latter might have been due to some vascular or toxic changes, from the presence of a large mediastinal carcinoma growth. The resulting phenomena evidently were sufficiently strong to show clinically as a myelitis, but anatomically were too mild to be detected under the microscope. Though instances in which central organic nerve changes fail to account for the clinical picture are becoming less and less frequent thanks to the improvement in histopathologic technique, cases still do occur in which even the most careful search reveals no pathologic changes whatever, or some so mild as to be altogether out of proportion to the severity and extent of the clinical phenomena as in the case here recorded.

THE CARTESIAN METHOD AND THE BIOLOGICAL CONCEPTION OF THE HUMAN PERSONALITY

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That excellent historian of biological theories, M. Ràdl (of Prague) has upheld the idea, based upon very precise data, that the scientific method derived from the work of Galileo constitutes a factor of regression, seen most plainly in that which concerns the further evolution of biology. This historical view, which need not be examined here, is, let us observe, an unexpected confirmation of the Bergsonian theory of the natural lack of comprehension of the inherent things of life on the part of *intelligence*, the latter understood as the *function of carving out and opposing*.

This latter may be identified with the essential point of the Cartesian mechanism, and it is in starting from this that we proceed to outline in large features the way in which Ràdl's thesis applies itself more exactly to psychology. Here, we have by no means to distinguish a materialistic point of view or one attributing reality only to the psyche. In one case as in the other, we have to do with the same process. We may arbitrarily carve out the given reality in one language or another. Medicine was a stumbling block for the Cartesian mind because of the very particularly teleological character of the phenomena which presented themselves for its study, so that it is the physicians who have been the guardians of the ancient naturalistic tradition (Hippocratism in all its forms). It is curious, therefore, to discover that it is the Cartesian spirit which, by its artificial dualism, has presided at the birth of modern psychiatry and the unfortunate influence of which is still to be perceived in it. This is exerted principally in France through the medium of Locke and Condillac. The essence of the psychiatry of Pinel, Esquirol, or Leuret, is, one may say, contained in the following passage from Locke: "In fine, the defect in *Naturals* seems to proceed from want of quickness, activity, and motion, in the intellectual Faculties, whereby they are deprived of Reason: Whereas *mad Men*, on the other side, seem to suffer by the other extreme. For they do not seem to me to have lost the Faculty of Reasoning: But having joined together some *Ideas* very wrongly, they mistake

them for Truths; and they err as Men do that argue right from wrong Principles: For by the violence of their Imaginations, having taken their Fancies for Realities, they make right deductions from them. Thus you shall find a distracted Man fancying himself a King, with a right inference, require suitable Attendance, Respect, and Obedience: Others who have thought themselves made of Glass, have used the caution necessary to preserve such brittle Bodies. . . . But there are degrees of Madness, as of Folly; the disorderly jumbling *Ideas* together, is in some more, and some less. In short, herein seems to lie the difference between Idiots and mad Men, That mad Men put wrong *Ideas* together, and so make wrong Propositions, but argue and reason right from them: But Idiots make very few or no Propositions, and reason scarce at all."¹

Here we have the essential principle of the classification of Régis, more than a century later, into *psychopathic diseases* and *psychopathic weakness*. It is always the conception abstracted from the mental content, artificially deformed by reflection, upon which reasoning is based as upon a fact *naturally* sufficient unto itself.

One will not be astonished, in consequence, at the similarity which is to be found beneath the different forms of speech among the theories set forth in epochs far removed the one from the other. If one takes, for example, the interpretation which François Sylvius Deleboé gave in the seventeenth century of somnambulism: "Adeo ut somnambulationis (ut sic loquar) duas agnoscam et constituam causas simul concerrentes: 1. Somnum profundum et altum. 2. Animam uni objecto cum affectu forti affiam, et proinde ab aliorum objectorum consideratione abstractam."² "Just as I recognize and establish for somnambulism two causes concurring at the same time: 1. Profound and deep sleep. 2. A mind fixed to one object with strong affect, and therefore withdrawn from consideration of all other objects."² It is easy to recognize here the essential principle of the theory so in vogue at the end of the last century, that of the *narrowing of the field of consciousness*. Thus also we have shown elsewhere the identity under different forms of the views set forth by Malebranche upon the physiologic pathology of hallucinations with those expressed by Tamburini.³

At the end of the nineteenth century the advent of the *experi-*

¹ John Locke: An Essay Concerning Humane Understanding, London, 1706, Book II, Chap. XI, § 13.

² F. Deleboé Sylvii, Opera medica, Amstelodami, apud D. Elsevirium, 1680, p. 476, § XXXI.

³ R. Mourgue, Essai sur l'évolution des idées relatives à la nature des hallucinations vraies, Paris, Jouve, 1919.

mental psychology of Fechner, then of Wundt, seems to have been, because of the vicious hypothesis of psychophysical parallelism, merely a new form, not without interest, it is true, of analytic thought in extreme degree. The psychiatry of Kraepelin (a pupil of Wundt) is the counterpart of this, in pathology. It is strange, furthermore, to discover how the theory of consciousness in the manner of Kant has preoccupied many of the German psychologists of this period. It is necessary therefore to note that if one speaks of *physiological psychology* one continues to ignore the part which *biology* must play.

It is beyond question that upon M. Bergson, as we have shown in detail elsewhere,⁴ falls the honor of having pointed out, in putting the question in regard to the problem of aphasia, the possibility of translating certain psychic phenomena into the language of action. By that means, one would be constrained to view the individual *as a whole*, and the actual evolution of science tends more and more in this direction, especially in the United States (White, Jelliffe). It will not be without interest, we believe, to remark that the novel manner in which M. Bergson has considered the problem of the theory of consciousness in *Creative Evolution* is a confirmation of the biological point of view. The psychic activity under all its forms is a vital function, not the product of mathematical abstraction. We will add that language, being the product of a long evolution, chiefly social, must be a great source of difficulty in psychology, if we do not wish, according to the formula of Bergson, to be dealing "with the evolved . . . and not with evolution itself. . . ." This latter consequence has been very well perceived quite independently by v. Monakow, who would see in the language of the present time the principal obstacle to the comprehension of pathological phenomena, those which constitute the phenomena of dissolution or of regression.

We come, therefore, at this time to consider human psychic activity as a biological phenomenon; that is to say, without adhering to any of the antiquated philosophic theories, with regard for scientific research, we avoid *a priori* the hypothesis of parallelism. It is without dispute, for example, that there are certain phenomena which we may readily qualify as *archaic* (Jung, paleopsychology of Jelliffe), in very close connection with organo-vegetative tonus. We have found, for instance, that in injecting a sufficient dose of atropin a special state is provoked absolutely untranslatable by means of language (Kakon crisis of v. Monakow). The impression is given,

⁴ R. Mourgue, Le point de vue neurologique dans l'oeuvre de M. Bergson, *Revue de Metaphysique et de Morale*, Jan.-Mar., 1920.

extremely painful in character, of imminent death; sometimes the impression "that something terrible is going to happen." The regularity and uniformity of this phenomenon reveal a very close relationship between the organo-vegetative condition and a psychic state; but, let us keep in mind, the physiologic level involved is a very low one. The same would be true of certain dreams, such as the zoöpsies so characteristic of particular states of intoxication (ethylic, among others). If, however, we consider the normal dream or the cases described by the Jaensch brothers under the name of *Eidetiker*, we will see a certain connection between a definite state of vagal tonus and a certain mental content, but the latter infinitely exceeds the somatic condition, which is quite trivial in amount.

It need not be thought that we adhere to a dualism, any more than to an obsolete monism. If psychic activity is an indisputable reality and not an epiphenomenon, it is a process only artificially isolated from the whole, which is the behavior of the organism. In the behavior of the muscular reflex, the effect is not equal to the cause, because there is present a selection, an integration, of the afferent excitations (Sherrington, Head); in the same way the psychic activity is not the exact equivalent of the total somatic activity. It is none the less true that only the consideration of the whole corresponds to the reality. There is a proposition here which the new *form* (*Gestalt*) *psychology* has made its own but which in reality is contained in M. Bergson's biological criticism of consciousness.

The activity manifested by living organisms does not appear to differ essentially under their various modes no matter how elementary—which are pure creations of the mind.⁵ We always have to do with a *structural activity* which manifests itself as well in morphology (Vialleton) as in physiology; only, if these two latter points of view are sufficient in themselves, the comprehension of the psychic activity does not seem to us compatible with the analytic point of view of that to which we have applied the generic term of the Cartesian method. It is here that the *biological method* enters in, which conceives of the individual as a whole and which unites in itself all techniques. From this standpoint, we are brought on the one hand to distrust the language of classic psychology and to attempt to replace it; and it has been characteristic of the genius of v. Monakow,

⁵ Ariëns Kappers, *Les actions psychiques dans le développement organique* *Acta zoologica*, 1920, and R. Mourgue, *Causalité agglutinée, représentations collectives et loi du tout ou rien*, *Schweizer Archiv für Psychiatrie u. Neurologie* (Monakow's Festschrift), 1923.

that he has made this the basis of his conception. On the other hand, in maintaining the teleological character, the prospective power (Driesch) of the organism (*hormé* of v. Monakow) we are led to understand the importance of certain elementary physico-chemical conditions, such as of the equilibrium of the Ca and K ions in relationship with the endocrino-vegetative system (subthalamie regulatory centers).

It will be the work of the future, and of a future which we believe approaching, to show all the fertility of this new orientation of human science (approximate term, but which should be substituted for the obsolete expression, psychology).

It should not be forgotten, meanwhile, that at bottom this means a return, under a form very highly evolved, to the vitalistic thought of antiquity, which did not separate the organic vegetative life from the psychic life (Aristotle, Hippocrates, Galen, then Fernel, Stahl, Bichat, etc.). This is the reason why the Anglo-Saxon physicians (of whom S. E. Jelliffe in the United States is one of the most representative) have had the happy idea of adhering to the name Neo-Hippocratism.

From this point of view, and this point of view only, it is questionable whether the mathematical thought of Descartes has signalized progress in the history of human knowledge.

DEMENTIA PRECOX IN TWINS

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The occurrence of psychoses in twins is comparatively rare and the incidence of dementia precox in twins even more so, if the literature on this subject is an indication.

It is not our purpose to present a full bibliographical study yet a few instances may be given in general orientation of the subject. Marro in 1893 was able to collect 20 cases of psychoses in twins, and Soukhanoff in 1900 presented a complete report on "*Folies Gemellaires*,"¹ among which cases evident schizophrenic psychoses are recognizable. It may interest American readers to note that Rush (1812) is quoted as one of the first to report such psychoses in male twins. His cases were apparently depressed manics as they both suicided. Moreau de Tours (1859) cases in boy twins were manifestly schizophrenics. Some twenty-nine cases are reported in Soukhanoff's study, most of which were schizophrenics. His personal case, XXX, brothers of thirty-three, he himself diagnoses as dementia precox, a term just about coming into general usage in France about this time. His study is full of interesting details.

Occasional case reports have appeared since then, those of Morris Franz,² Laignel-Lavastine and Boutet,³ Arnaud and Janet in discussion (same communication, page 271), and Grassl⁴ being of interest. Grassl reports an interesting family group in which twin brothers born of a "peculiar" father and an average mother, early in their school life were "peculiar," holding themselves aloof from their playmates and neighbors. They both developed ideas of reference on the same day, which ideas were quite similar in content. In (1) the schizophrenia developed much more stormily than in (2). He had had a severe head trauma before the outbreak of the psychosis. The course of the disorder progressed to quite similar end states. In external configuration the brothers were much alike.

My own case is as follows:

¹ *Annales Med. Psych.*, 12, 1920, 214.

² *JOURNAL OF NERVOUS AND MENTAL DISEASE*, 50, 1919, 325.

³ *L'Encephale*, 15, 1920, 267.

⁴ *Arch. f. Rassen u. Gesselsch. Biol.*, 14, 1922, 177-178.

CASE 1. J. W., first seen at out-patient department, Cincinnati General Hospital and on recommendation, later admitted to Longview State Hospital, July 11, 1922, white, male, age twenty-one, clerk, single, two years of high school; duration given as three years, gradual in onset.

Family History. Grandparents all dead, ages unknown, father dead, fifty-two years of age, barkeeper, drank heavily and was very nervous. Mother living—fifty-two years age, general health poor. Six children, five boys and one girl. One brother dead, one brother married, having one child in good health. Sister, twelve, in good health. (This sister at fourteen, according to mother, is developing mental symptoms and displaying peculiar conduct.) The married brother is shiftless and does little work. Further nervous and mental history negative.

Personal History. Born December 8, 1900. Through common school and two years high school. Worked as clerk in office for six years. Ordinary diseases of childhood, otherwise no history of physical illness.

Neurological Examination. Pupils react to light and accommodation; some slight impairment of right side of face. Rather protruding eyes but no evidence of thyroidism. This tendency also found in other members of family. Hearing good. Tongue movements normal. Romberg negative. Gait—no impairment. Babinski negative. Patellar reflexes—exaggerated. Speech good. Heart, lungs and general physical examination negative.

Wassermann—Ice box. Plain antigen and cholesterinized antigen negative. Urinalysis—Negative except for presence of large amount of indican.

Mental Status. While working as clerk became nervous, wanted mother to take him to doctor—went to City Hospital and from out-patient clinic to Longview State Hospital. Denies hallucinations.

Since in hospital not nervous, denies probate court record. Mother knew of no reasons for sending him to Longview. No hallucinations, or abnormal conduct, quiet, remained in home great deal; desired work but could not find it. Brother and sister-in-law say they saw nothing wrong, no behavior defects, conduct not out of ordinary, except "nervous."

Patient stated that people look at him in a peculiar manner and that he came here to see if anything was wrong with him. Nicely behaved but somewhat depressed. Everyone talks about him and makes fun of him and that they call him "nutty." Well oriented. Suspicious of proceedings during the examination. Saw people look and laugh at him on street. Ideas of reference. Continually complained of being nervous. Quiet and harmless on ward. Remained by himself a great deal of the time.

Progress. Stamps feet at table for a time before starting to eat. Became violent, attacking patients without reason (and answering "just for fun," when asked why). Very foolish; said he could not get along at home because of his mother. Peculiar rolling of eyes, talks fast, indifferent and restless. Walked great deal. Apparent auditory hallucinations by actions but would not admit voices nor would he deny them. (Mother said he complained of voices accusing and annoying him.) Burst out in uncalled-for laughter. Talked to self. Tried occupational therapy but compelled to discontinue because of conduct. Would stare into space for an hour or more at a time. Untidy and destructive at times. Said other members of family interfered with him and his success.

Hospital Note. Restless, silly, seclusive, wants to be continually examined or making other foolish and unreasonable requests. Hides in closets, stares into space, stops while dressing to stare into space for a time. Would sit down, take a book, attempt to look at it, arise, walk down hall, ask questions and return to chair. Purposeless movements. *Diagnosis:* Dementia precox hebephrenic.

August 11, 1922. Paroled to report to me at out-patient clinic of General Hospital. Mother reports him as foolish, that he examines, smells, and tastes food carefully. Denies auditory hallucinations. Wants to go to work, but never does; curses mother each morning and made life miserable, so mother had to leave home. Case devoid of anything acute and mother said he was only nervous. Displayed no hallucinations or apparent delusions, although attitude and conduct plainly disclosed repressed ideas that he carefully avoided discussing and denied when questioned.

November 10, 1922. Social worker's report: Makes no effort to adjust; dissatisfied, does not get along with brother. November 23, 1922, curses great deal, quarrelsome, will not keep job. December 6, 1922, more and more difficult to manage. Wants family to move. They did. December 23, 1922, returned to hospital; March 8, 1923, again paroled. Quiet, harmless, by self most of time, silly, grins continually in foolish manner. May 27, 1923, returned to hospital; August 11, 1923, paroled. December 23, 1923, returned. Was unable to adjust. Irritable, nervous, quarrelsome about the house, cursed a great deal. Refused to work regularly and finally became very difficult to manage. Each time family had to return him and he is now in Longview State Hospital.

CASE 2. W. W., admitted February 1, 1923, twin brother of J. W., twenty-two years of age, salesman, single. Duration given as one year. Gradual in onset.

Personal. Born December 8, 1900. Through common school and two years high school. Salesman and bookkeeper for short periods. Never able to hold position any length of time.

Neurological Examination. No strabismus. Pupils react to light and accommodation. Tongue movements normal. Speech somewhat slurred. Knee jerks, exaggerated. Lungs, heart and general physical examination negative. Pulse 88. February 28, 1923, attack grippe.

Wassermann—Ice box. Plain antigen and cholesterinized, antigen negative. Urinalysis—Shows trace albumin and presence of phosphates.

Mental. Unable to get along with family. Both this boy and his twin brother were suspicious of everyone. Always smelled food before eating. Irritable at home. Quarreled continually with family. Threw objects at mother and on one occasion cut her hand with knife. Complained of hands and feet "swelling up." Claims mother never taught them (twins) how to use their minds. Remains in house a great deal by himself. Has very little to do with other patients. Prefers sitting by himself. Judgment poor, memory good. Oriented time and place. Tries to evade questions.

Progress. Silly, foolish, peculiar shaking of head—never troublesome on ward. Laughs and talks to self, darts about here and there. Took occupational therapy and did better than brother. Would hang around doors, demanding to go home, saying that he had work to do. Stares into space.

Both have episodes of unusual restlessness, and both have large protruding eyes. There were many psychotic characteristics common to both and the conduct of one was practically identical with the other, both at home and in the hospital. This can be seen by the above histories.

Heredity stands out prominently in dementia precox and doubtless plays an important part. Various authors quote 50 to 90 per cent familial psychopathy ranging all the way from mental peculiarities in early youth, neuropathic and psychopathic personalities to the more pronounced psychoses.

Authors vary as to the particular form chiefly affected by heredity, but it is probably the catatonic variety with the paranoid form least affected. The hebephrenic type is more common in the male with the catatonic and paranoid types prevailing in the female.

Soren Hansen in an article in *Hospitalstidende*, January 11, 1922, on "Heredity in Dementia Praecox," explains the irregular manner of appearance as depending upon the coexistence of two or more formative factors which may be recessive or dominant, but any one of them may not manifest itself or give rise to other diseases than the one which develops when all factors operate together. Such polyhybrid diseases are rarely inherited through several generations because necessary factors which easily produce them in several brothers and sisters become separated until brought together again by consanguineous unions or unions of families possessing the same factor. The not uncommon presence of cases of dementia precox and manic-depressive insanity in some families may depend upon one of the factors being common to both.

Dementia precox does not depend upon a single recessive or dominant factor. It may depend upon two recessive factors but not on two dominant ones, as it would then be much more frequent. Two recessive factors might produce dementia precox, if both exist, singly or doubly, in both parents, even if none of these nor their ancestors for generations back has the disease.

With the evidence favoring the part played by heredity in dementia precox, may it not be expedient to direct our preventive efforts in this direction with the same enthusiasm displayed in the feeble-minded group?

The author has purposely avoided figures and statistics but in closing cannot but refer to the fact, that there are over 120,000 dementia precox cases in the United States, costing annually over twenty-five million dollars.

SOCIETY PROCEEDINGS

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY

REGULAR MONTHLY MEETING, FEBRUARY 19, 1925. WILLIAM
HEALY, M.D., PRESIDENT, IN THE CHAIR

THE EXPERIMENTAL PRODUCTION OF RIGIDITY WITH BULBO-CAPNINE

DR. HUGO MELLA

DeJong has shown that the tremor of paralysis agitans can be controlled by the use of bulbo-capnine and that in larger doses a hypertonic catatonic-like syndrome may be produced in cats. (Demonstration of cat under the influence of bulbo-capnine.)

Discussion: Dr. K. M. Bowman: Does the cat get fatigued? Is there an element of fatigue?

Dr. Mella: I have kept one in that position from four o'clock one afternoon until the next morning. This cat will probably be in good condition late to-morrow morning. Some do show signs of fatigue.

Dr. Bowman: He apparently moves his head pretty freely.

Dr. Mella: Yes, but only within a small radius. If I had given him a little larger dose, I could bend him like a piece of lead pipe, and his head would remain in any position that I placed it in.

Dr. Donald Gregg: What is supposed to be the site of the action of the drug, the central nervous system?

Dr. Mella: Yes, it must be. In a small dose it will stop tremor; in a little larger dose it will produce rigidity; in a still larger dose it will produce tremor, convulsions and death.

Dr. E. W. Taylor: Why is it so difficult to raise the plant from which this drug is derived?

Dr. Mella: There is no difficulty in raising the plant. The difficulty lies in isolating this one alkaloid. There are eleven alkaloids in the plant, and bulbo-capnine is one of them. The bulbo-capnine of the U. S. Dispensatory is not the pure alkaloid.

MENINGOCOCCUS MENINGITIS

DR. HENRY R. VIETS

In spite of our knowledge that meningococcus meningitis is a disease of known etiology, and in spite of the fact that we have a specific form of treatment, both the diagnosis and the treatment are often uncertain and the disease has a mortality of 25 to 35 per cent. Definite information is needed in regard to, first, the entering path-

way of the organisms; second, the primary site of the lesion, whether it be in the blood stream, meninges, or ventricles; third, the earliest clinical manifestations, especially the intermittent type of fever; fourth, the proper locus for serum treatment, whether intravenous, intraspinal, intracisternal, or intraventricular, and, finally, the cause of certain post-meningitic symptoms.

The following case illustrated many of the points in question:

A woman of twenty-nine, after a slight illness consisting of headache, slight purpuric rash on the extremities, joint pains and fever, was comparatively well for four weeks except for three distinct periods when she had severe attacks of headache associated with rises of temperature to 101° or 102° . These attacks lasted twenty-four hours, and each was preceded and followed by periods of practically no discomfort. The patient later developed signs of meningeal irritation but a spinal fluid examination failed to show meningococci. A cerebellar exploration was done in the hopes of discovering an abscess. No abscess was found but the fourth ventricle, dilated, contained cloudy fluid from which no definite organisms could be grown. Two days later when the symptoms increased, combined ventricular and lumbar puncture was done. Meningococci were found in both fluids and serum was given into both the ventricles and the lumbar spine. Intraspinal serum was again given twenty-four hours later. The patient made an excellent recovery. When seen four months later, she showed no symptoms of the disease.

The slight illness with purpura, joint pains, headache and mild fever was probably the time of beginning meningococcemia. Second, the three attacks of severe headache associated with increase of temperature are said to be characteristic of meningococcus septicemia. Meningococcemia cases have been described with this intermittent type of temperature lasting for many months before signs of true meningitis developed. It is considered possible, however, in this case that involvement of the central nervous system may have taken place through the choroid plexus and caused a ventriculitis early in the period of meningococcemia. In such an event, the severe attacks of headache and rise of temperature may have been caused by a temporary obstructive hydrocephalus. A diagnosis of meningococcus meningitis was not definitely established until meningococci were found in the lateral ventricles. It is possible that meningococcus meningitis always begins primarily as a meningococcemia and secondarily as a ventriculitis. If this is the case, as the above history would indicate, early serum treatment into the lateral ventricles is indicated.

CURRENT LITERATURE

I. VEGETATIVE NEUROLOGY.

1. VEGETATIVE NERVOUS SYSTEM.

Loewenthal, S. RADIUM EMANATIONS IN MIGRAINE. [Münch. med. Woch., LXIX, p. 971.]

A clinical therapeutic study of migraine treated by radium emanations, thirty-seven cases are reported upon. Nine were apparently permanently cured, eight were much improved, eight were slightly improved, two were not affected, while in ten cases the later results were unknown as the patients were lost sight of. These thirty-seven patients with migraine received radium-emanation treatment in from twenty to thirty sittings of two hours each, and breathed air containing about four Mache units of radium emanation to the liter. Typical psychogenic cure curve.

Schlesinger, A. MIGRAINE. [Schweiz. med. Woch., Jan. 25, 1923, LV, No. 4.]

This therapeutic communication unwittingly reemphasizes the value of almost anything in the treatment of certain migrainous individuals, the everlasting forgetfulness of clinicians that the migraine reaction is not a specific one, but is a widely generalized phenomenon, and that his pills of iron and calcium glycerophosphate with a laxative tea are like all remedies for migrainous individuals purely empirical shot-gun applications.

Baastrup, C. I. CALCIUM LACTATE FOR NERVOUS HEADACHES. [Uges. f. Laeg., Feb. 1, 1923.]

In this clinical paper the author describes a migraine syndrome which responds strikingly to the administration of calcium lactate. The type is that in which there are concurrent attacks of edema affecting the upper lip, eyelids, or one hand and occasionally a rhinorrhea. Apparently there is no fever, and while complaining of the headache the patient hardly notices the associated edema. It is also familial. In one family the mother and two daughters were subject to these attacks. One of the daughters knew when one of the others was suffering whenever she observed a slight swelling under the eyes. Another patient suffered from Quincke's edema. Edema of the meninges is a possible cause for the headache. The dose of calcium lactate recommended by the author is one gram once to thrice a day for a period of three weeks.

Curschmann, H. MIGRAINE IN CHILDREN. [Münch. med. Woch., LXIX, No. 51.]

Curschmann calls attention to the fact that migrainous attacks in children are much more frequent and important than is usually taught. It is frequent in private practice. Accompanying abdominal symptoms are frequent. Many supposed colics, many cases of supposed appendicitis, ulcer of stomach and duodenum are parts of a general vasomotor disturbance of which the migrainous attack is but one of the outstanding symptoms. [Heredity is practically always demonstrable since migrainous attacks are universal. It almost seems as useless to speak of migraine as hereditary as to speak of sleep, or dreaming or eating as hereditary.]

Vallery-Radot, P. MIGRAINE AND ANAPHYLAXIS. [Médecine, Feb., 1923.]

In this biochemically view-pointed paper the author maintains that some migraines are anaphylactic phenomena. Cutireactions obtained by Ramirez were positive in three cases (egg white, chocolate, celery). Pagniez and Nast observed a hemoclastic crisis after ingestion of chocolate in a case in which ingestion of chocolate provoked an attack. Vallery-Radot and Pagniez have prescribed, since 1916, the use of 0.5 gm. of peptone before meals in similar conditions. Some migrainous patients are favorably influenced, while the treatment is a complete failure in others. Other authors use subcutaneous injections of one c.c. of horse serum, repeated weekly, and other means of desensitization.

Löhlein, W. BLINDNESS AFTER MIGRAINE. [Deut. med. Woch., XLVIII, No. 42.]

This communication advocates the use of a remedy frequently employed by older generations, namely, amyl nitrite. The fairly well recognized vasomotor spasm stage of the migrainous attack, in its ocular manifestations is often relieved by its use. Whether he speaks of the blinding scotomata or more permanent but infrequent amblyopias, the pharmacodynamic action is the same.

Moodie, A. R. CASE OF OPHTHALMIC MIGRAINE WITH UNUSUAL SYMPTOMS. [Brit. Med. J., Dec. 30, 1922, II, No. 3235.]

A case report called unusual, of a severe ophthalmic migraine with epileptiform complications; a frequently reported syndrome. [See Osler's Modern Medicine, Migraine.]

Hubeny, M. J. POSITIONAL ANOMALIES OF THE GASTRO-INTESTINAL TRACT. [Journal of Radiology, Sept., 1922.]

The X-ray examination has given antemortem information of intestinal value as to what is anatomically usual or unusual, and has altered many accepted notions. It is now generally accepted that there are harmless variations from what constitutes normal position and relation-

ship of the abdominal viscera. Many an innocent stomach has been lifted up and numerous mobile cecums unnecessarily anchored because of false notions of position and movability. The purpose of the present paper is not to include positions affected or accompanied by inflammatory reactions, but to consider the subject from the standpoint of embryology; and to understand these embryonic abnormalities it is necessary to visualize clearly the steps of peritoneal rotation, descent and fusion and the changes in the respective positions of the large and small intestines during the process. There are four principal processes involved, migration, rotation, descent and fixation. Variations in these normal processes may occur by excess or defect. The cases where the first two feet or so of the jejunum pass to the right are worth notice, as this has a special bearing on the technic of the no-loop-gastrojejunostomy as practiced in the Mayo operation and would call for a reversal of the manner of placing clamps on the jejunum.

Every operator, Hubeny says, expects the viscera to occupy ideal (fictional) positions; if the organ is not there he hunts for it where previous experience has taught him to look for it. If he has been carefully trained in embryology he might surmise where to look and what to observe; if not he begins to hunt over the greater part of the abdomen with dire results to the patient. It sometimes happens that the first and second parts of the duodenum are situated unusually far to the right, and in certain instances it has been proven that an appendix was the cause of the trouble, which was discovered only after complete gastro-intestinal X-ray examination revealed the presence of an anomaly. The colon offers many opportunities for variations. As regards migration, the intestine might remain in whole or in part without the abdominal cavity or pause at any point along its developmental path; such deficient migration is matter of common surgical knowledge. Variations in rotation concern the manner in which the colon and its rotation may be deficient or excessive; in the first, the ileum would enter from the right and posteriorly and in the latter case anteriorly. In abnormal rotation combined with fixation the ileum can hardly escape being kinked. As to the cecum, minor variations from the normal position are usually found; there may be hypodescent or hyperdescent. In the former the cecum lies anywhere between the region of the liver and its normal site; if it goes beyond its normal position into the pelvis or develops such proportions that it is possible for it to lie in the pelvis, it is said to be hyperdescended. Hyperdescended cecums may be divided into two groups depending upon whether the colon is attached to the parietal wall or has a mesentery. The process of fixation is a physiologic fusion of contiguous peritoneal surfaces and offers numerous variations, divided into hypofixation and hyperfixation. The favorite sites for variations are the cecum, hepatic flexure, transverse colon, splenic flexure, the descending at the level of the iliac

crest and sigmoid. The splenic flexure occasionally runs up as high as the diaphragm, and when filled with food may simulate a tumor mass on palpation and percussion; sometimes gas may replace bowel contents when tympany is elicited, and both these conditions might be misleading if the location of the colon were not known.

Hubeny insists that symptoms confirming roentgenologic findings should be present before instituting such procedures as colonic resections, extirpations, anastomoses, and organ suspensions and fixations.

Arce, J., and Castano, C. A. CELIAC AND HYPOGASTRIC NEUROSES. [Sem. Méd., Nov. 30, 1922, II, No. 48.]

Arce and Castaño assert that pathology of the sympathetic system is being recognized in many conditions hitherto ascribed to gallstones, ulcers, etc. Sympathetic tonus is determined by the balance of the endocrine organs. Hence organotherapy is indicated in the celiac and hypogastric neuroses. The complete picture of these two types of abdominal neurosis is described with the treatment that has been found effective.

Heyer. MENTAL INFLUENCE ON GASTRIC SECRETION. [Arch. f. Verd.-Krank., Dec. 21 and 29, 1922, Nos. 1 and 2.]

Heyer's research during hypnosis, a fine stomach tube in place, with continuous aspiration, demonstrated a remarkable variability in the acid content of the gastric juice in the same person at different times after both test meals and suggestion. The suggestion of pain, danger, recalling of war happenings, arrested at once the gastric secretion in nearly all the subjects. The suggestion of agreeable events, a spring day, winning money in a lottery, etc., never had the opposite effect, but had the same arresting influence, only it occurred more slowly. His research thus has demonstrated the law that any diversion of the mind, painful or pleasurable, from the act of eating, checks the secretion of gastric juice. The effect is more pronounced, the stronger the mental impression. In one patient with pure mania the gastric secretion was found constantly normal. In all the subjects, the stomach secretion increased at once in large amounts when a nutrient enema was injected. The distention of the rectum evidently promoted secretion in the stomach by reflex action, as all psychic factors were excluded, and the reaction occurred too promptly for the nourishment to have made its influence felt. The findings in this line suggest the necessity for giving nutrient enemas a drop at a time, with gastric ulcer, to avert this reflex action from distention of the rectum. His tables show, for instance, a drop from 10 or 20 or 18 to 0.5, 2 and 1 in the amount of gastric juice secreted under the suggestion of bombing, a railroad accident or the like. The drop was from 10 to 3 under suggestion of good news.

Atropin given before or with the sham feeding checked secretion, but it did not seem to influence it when not administered until the secretion was well under way.

Kopeloff, N. IS STOMACH FOCUS OF INFECTION? [Am. Jl. of Med. Sc., Jan., 1923, CLXV, No. 1. J. A. M. A.]

The study made by Kopeloff showed that the bacterial content of the stomach is influenced by the saliva; hence it may be inferred that the stomach is not acting as a focus of infection, but merely as a receptacle for the bacteria poured into it. This is in agreement with the bacteriologic investigations of others to the effect that gastric acidity is sufficient to prevent bacterial development.

Brosotto, P. PATHOGENESIS OF GASTRIC ULCER. [Rif. Med., June, 1922.]

Before discussing the results of his own laboratory researches on the pathogenesis of gastric ulcer, this paper gives a detailed examination into the principal theories advanced on the pathogenesis of gastric ulcer. The author cites and criticizes the hyperchlorhydria theory advanced by Riegel, Talma, and others, and asserts that the phenomenon is not a primary one, nor is it a condition sufficient to explain the pathogenesis. The vascular theory, associated with the names of Virchow and Klebs, he dismisses as untenable, for the reason that the experimental thrombosis does not produce an ulcer, but only some transitory, hemorrhagic effusions (notwithstanding the fact that, with the fastening up of the vessels, it was possible to have chronic ulcer). In the critical examination of the author the traumatic theory of Morgagni and P. Marie have also met with disapproval. He bases his theory of the pathogenesis of gastric ulcer in the relations which exist between the ulcer and the patient or latent disturbances in the nerve centers. In support of this proposition he undertook and carried out experiments on dogs with satisfactory results. Having cut the vagus at the neck, and administering repeatedly a solution of hydrochloric acid *per os*, the results were positive. He succeeded in producing gastric ulcer. He expounds the results obtained, the diminished motility of the stomach, delayed digestion, the mechanical modifications of the pyloric reflex by which evacuation is retarded and mechanical lesions easily provoked, determined by pressure from retained alimentation. The spasm of the vesical walls is not overlooked and the permanence of the lesion is demonstrated in the permanent perverted vitality of the cellular elements. If this condition does not always obtain, it must be explained by the functional assistance of the system of intrinsic gastric innervation of the Opeschowski ganglia; because gastric ulcer can only be determined when both systems are involved. Finally, the author discusses the relations of the endocrine glands—more especially the suprarenal capsule—to gastric ulcer. In this connection the author refers to experiments—cases of ulcer by reason of deficiency of the adrenalin

hormone, with asthenia and general adenemia, anorexia and vomiting. He had disturbed the trophism of the gastric wall, had overexerted the power of the gastric juice and had produced gastric ulcer. At the autopsy there was found a pyloric ulcer which involved the mucosa and the musculature. These results must be explained by the anatomical and functional relations of the endocrine glands to the vagosympathetic system. Therefore, according to Brosotto, gastric ulcer is the result of a trophoneurotic disturbance which originates from another disturbance, which acts upon the vagosympathetic apparatus, the perfect functioning of which maintains the equilibrium of the gastric wall.

Leake, Chauncey D. THE ACTION OF MORPHINE ON THE VOMITING CENTER IN THE DOG. [Journ. Pharm. Exp. Thera., Dec., 1912, XX, 359-364.]

After a characteristic emetic response to morphine, subcutaneous injections of either emetine or apomorphine or both, in large doses, failed to produce any indications of emesis when given during the period of depression. That this was not due to fatigue of the vomiting center was shown by giving repeated subminimal doses of morphine, with no emesis, until depression came on, when apomorphine and emetine were ineffective. Moreover, in a control animal, repeated injections of emetine and apomorphine (at hour intervals) produced in each case characteristic emesis. It is suggested, in view of the primary respiratory and vagal stimulation which is followed by the more prolonged depression, together with these observations on the vomiting center, under morphine, that the principles outlined by Gasser and Loevenhart (Journ. Pharm. Exp. Thera., 1914, V, 239) for the medullary responses to reduced oxidation are operative following morphine. Cloetta (Arch. f. exp. Pharm., 1903, L, 435) has shown that brain tissues fix morphine better than any other tissue, and that it is presumably destroyed there by oxidation. [Author's abstract.]

Jacobsen, H. SPASTIC INTESTINAL OBSTRUCTION. [Hospitalstidende, Nov. 8, 1922, p. 753.]

H. Jacobsen notes that some surgeons are inclined to deny the very existence of spastic ileus. Though it certainly does exist they are wise in thrusting it in the background, for if this diagnosis were to be freely indulged in many a life-saving laparotomy might be omitted. By 1920 Sohn was able to collect thirty definite cases, and in the same year Nagel collected forty-five cases in which the diagnosis was confirmed either by biopsy or necropsy. The chief interest of the case recorded by the author lies in the fact that laparotomy was performed twice, with an interval of only a day and a half; on neither occasion was there found any explanation for the obstruction other than spasm of the gut. The patient was a girl aged seven, who was admitted to hospital with violent pain under and to the left of the umbilicus. The

pain was colicky, there was retention of flatus and feces, and she vomited mucus frequently. The abdomen was slightly distended, and during a bout of colic the contour of a coil of gut was demonstrable in the right abdomen. Laparotomy revealed coils of small intestine, some of which were distended with gas, while others were completely collapsed and contracted, the transition from the one condition to the other being abrupt. But there was no stricture or furrow at this point. As the symptoms became most alarming after the operation it was repeated, but again nothing was found to explain the symptoms. Complete recovery ultimately followed after treatment with gastric lavage, enemas, and castor oil.

Colmers, F. SPASTIC ILEUS IN INFLUENZA. [Zent. f. Chir., Dec. 30, 1922, XLIX, No. 52. J. A. M. A.]

Colmers mentions three cases of spastic ileus associated with influenza, in all of which an operation was performed. No obstruction was found, but only spastic contraction of the intestine, which had given rise to the clinical symptoms. This condition may occur frequently during an epidemic of influenza. If colicky pains and similar symptoms associated with diarrhea and vomiting appear, spastic ileus should be suspected. In his cases an erroneous diagnosis was more or less excusable, since the onset of ileus symptoms was acute and, in spite of all treatment, the vomiting could not be checked nor the severe subjective symptoms relieved. In doubtful cases, however, he would still prefer to make a small abdominal incision, in order to discover the true condition of affairs, rather than run the risk of overlooking true intestinal occlusion. Spastic ileus in influenza may be due to the action of the central nervous system on the intestinal musculature. An irritation produced by pathologically affected mesenteric glands may play a part, or possibly a toxic influence from the intestinal contents.

Glaser, A. GASTRIC AND INTESTINAL ULCERS AND LEAD POISONING. [Berl. klin. Wchnschr., LVIII, 152-3.]

Glaser, who found ulcers in the stomach and duodenum in a very large proportion of cases of plumbism, in no way differing from ordinary peptic ulcers, considers that the ulcers in such cases are not the results of a special predisposition, but are caused by toxic vagotonia.

Finney, J. M. T., and Friedenwald, J. PYLOROSPASM IN ADULTS. [Am. J. M. Sc., CLXII, 469-81.]

This surgical paper records eleven illustrative cases of pylorospasm which is regarded as a complex nervous phenomenon, the exact etiology of which has not been satisfactorily settled. They attempt to erect three types: the neurotic, the irritative, and the reflex. In the largest percentage of cases the condition is secondary to some irritative lesion in the stomach or is reflex from disease of some other organ. Many of

the cases are promptly relieved by the removal of the cause, *e.g.*, chronic appendix, gallstones, etc. There exists, however, a purely neurotic [psychogenic is a better term—Ed.] form without any demonstrable (*i.e.*, by ordinary objective methods) lesion. The condition can usually be recognized clinically. The symptoms consist of pains of the hunger type appearing two or three hours after meals, which are relieved by emptying the stomach of its contents as well as by ingestion of food; of contractions of the stomach leading to tumor formation, which disappear as the spasm relaxes; of symptoms of intermittent stagnation and hyperacidity. Pylorospasm is best recognized by X-ray examination, by means of which the psychogenic as well as the chronic somatic or structural forms may usually be differentiated. Treatment consists in overcoming the primary neurasthenia by dietetic or hygienic measures. [Rarely of value, psychoanalysis reveals the underlying psychogenic causes.—Ed.] During an attack the best results are obtained by hypodermic injections of morphia with atropine following a thorough lavage of the stomach. Atropine in full doses is the most useful drug. When medical treatment fails, pyloroplasty gives the best results. This removes some of the effects, but leaves the causes to develop some other disorder.

Mathieu. GASTRIC TUMOR OF NEURAL ORIGIN. [Bull. et. Mem. de la Societe de Chir. de Paris, May 23, 1922.]

Mathieu reports an interesting case of a pediculated tumor removed from the pyloric region of a patient aged fifty years. Pathological examination of the specimen showed that it was a tumor of nervous origin, analogous to the growths sometimes found in the viscera in Recklinghausen's disease. The patient had not exhibited any other symptoms of this affection. It is generally recognized that a tumor of nervous origin may arise from the sheath of Schwann, and the writer suggests that in all probability this was the nature of his case. This patient did not exhibit any cutaneous nodules, such as one usually finds in Recklinghausen's disease. These neurofibromata arising in connection with the viscera appear to be rare. Lecène reported a case of fibrosarcoma of the small intestine in a patient who showed multiple pigmented areas and small nodules scattered over the whole body. He resected the intestine and attached tumor and the patient recovered. Recklinghausen himself has described, under the disease which bears his name, tumors of this nature: in one case he records two sarcomatous stalked tumors arising, one from the stomach, the other from the jejunum.

Stargardter. INTESTINAL NEUROSSES IN INFANTS. [Jahrbuch für Kinderheilkunde, Vol. XCVIII, Nos. 3-4, p. 189. J. A. M. A.]

Stargardter reports the cases of three breast fed and apparently normal infants who developed diarrhea, flatulence and colic for which no explanation could be found in the food or infection. Formed stools appeared after four or five daily intramuscular injections of epinephrin.

and the cure was complete by the eighth or tenth day in two of the infants; the other child had several relapses. Probably intercurrent infections were responsible for this. The benefit from epinephrin seems to stamp the dyspepsia in such cases as a sympatheticotonic neurosis, if all other causes can be excluded and dietetic measures fail to relieve. These children showed no signs that suggested the exudative diathesis, and after recovery did not display any tendency to nervousness.

2. ENDOCRINOPATHIES.

Kisch, F. PSEUDO-OBESITY. [Med. Klin., XVIII, No. 46.]

In this communication a group of patients is described in which an enlarged abdomen, slight overweight with only a slight increase in the fat of the abdominal walls are characteristic. The diaphragm stands high and this can cause angina with shortness of breath. The usual treatment for obesity fails in these cases, but they are quickly ameliorated by cathartics, massage of the abdomen and application of heat on the abdomen. Kisch attributes the symptoms to a sympatheticotonic inhibition of the intestinal movements.

Barlow, D. L. APITUITARISM AND THE ANENCEPHALIC SYNDROME. [Br. Med. J., Jan. 6, 1923, I, Nos. 32, 36.]

This is a pathological report of four anencephalic monsters. In each the pharyngeal portion of the pituitary was found in its correct position. In the others the sella turcica had not formed, although there was a full sized pituitary. In one neuroglial tissue, probably representing the pars nervosa, was found. In all structures corresponding with the epithelial segments of the pituitary body—namely, strands of polygonal cells with somewhat granular protoplasm and rounded nuclei were found. They represent the epithelial portions of the pituitary. As a result of these studies Barlow thinks it may be concluded that the other features of anencephaly are certainly not due to apituitarism.

Arnoldi, W. METABOLISM IN OBESITY. [Zeitsch. f. klin. Med., Vol. XCIV, Nos. 4-6, p. 268.]

This rather detailed biochemical study deals with possible interrelationships between certain metabolic postulates (falsely called norms) and the tendency to the collection of fat. In one respect it is an advance on other studies of the laboratory type in that the author sees behind the reactions certain types correlated with neuropsychiatric activities. In other words the parasympathetic and sympathetic types have definite divergent metabolic trends. The emphasis is placed on the psychological type as influencing the metabolism, rather than the metabolism making the psychological type, although an interrelation is postulated.

Loewy, A., and Zondek, H. ENDOCRINE OBESITY. [Zeits. f. klin. Med., XCV, Nos. 4-6.]

This clinico-metabolic study showed the average figures of basal metabolism in a group of obese individuals, supposedly due to pituitary participation. The clinical picture of localized obesity, in upper or lower extremities, is discussed. Lowering of basal metabolism is not an interpretation, and thyroid treatment may reduce the whole body except these masses of fat. These cases resemble Simon's lipodystrophy. One patient had a low water excretion which was modified nearer the thus far established norm after thyroid treatment.

Neff, James M. ADIPOSIS DOLOROSA. [Ill. Med. Journ., Sept., 1921.]

Up to 1918, according to this historical summary, about one hundred cases had been recorded. The article contains nothing new, but is a useful review of the limited type of the syndrome.

Case, C. E. PITUITARY TUMOR DIFFERENTIATED FROM MYASTHENIA GRAVIS. [Clifton Med. Bull., VIII, Oct., 1922.]

The patient, a woman, age fifty-one, complained of headache and double vision. The present illness began (January, 1922) with occipital headaches which radiated into the temporal regions. At present (August, 1922) they are bitemporal and dull in character. Fatigue occurred in the spring, increased slowly and finally prevented any physical effort. Short periods of rest relieved the fatigue temporarily. Disturbance of vision began early in June and two weeks later double vision occurred suddenly caused by internal rotation of the left eye. Stuttering was noticed at the same time, and lasted about two weeks. The right eye rotated inward one week after the rotation of the left. Physical examination showed paralysis of the external rectus, superior and inferior oblique, and superior palpebral muscles of the left eye. The same muscle paralyses were present in the right eye except the superior palpebral. Eye grounds revealed tortuous arteries and slight optic atrophy. Visual fields showed very moderate constriction of the white and marked constriction of the red and blue fields. All laboratory examinations revealed normal findings except occasional glycosuria and a diminished glucose tolerance. Myasthenia gravis was suggested by ptosis of the left eyelid and ocular paralyses, history of stuttering, history of fatigue, and lowered glucose tolerance. The absence of the myasthenic reactions and signs of fatigue was against this. The presence of bitemporal headaches, slight optic atrophy and ocular paralyses suggested some condition causing increased intracranial pressure and pressure on the third, fourth and sixth cranial nerves. Aneurysm of the basilar artery or tumor of the pituitary region are causes of pressure in the region of these nerves. A radiogram of the sella turcica showed bone destruction of part of the floor and posterior clinoid process. A diagnosis of pituitary tumor was therefore made and the case referred

to Cushing who reports as follows: "Transfrontal operation revealed a thickened arachnoid. . . . The ocular paralyses have largely cleared up, but no absolute diagnosis can as yet be made. [Author's Abstract.]

Terrien, F. RADIOTHERAPY OF PITUITARY TUMORS. [Presse Médicale, Vol. XXX, No. 40, p. 429.]

This clinical therapeutic paper is optimistic relative to the value of a combination of organotherapy, mercurial treatment and the roentgen rays in pituitary tumors. Treatment is particularly striking on the trophic disturbances, the headache and the impairment of vision. It analyses the clinical records of 148 cases of pituitary tumors with visual disturbances. Blindness was present in thirty-four, choked disc only in fifteen; in ten treated with radiotherapy the improvement in the visual field is evident from the charts given. In some vision was improved even after several months of blindness. Bécclère irradiates the pituitary through mouth, brow and temples, where the bone is thinnest, using 5 H. units at each sitting. In all his cases the action was durable. One patient has had no recurrence after nine years. In one of the cases the radiotherapy seemed to reduce the visual field, hence it is no method for the untrained lay therapeutician.

Vallery-Radot, Pasteur, and Dollfus, M. A. ADIPOSIS DOLOROSA. [Bulletins de la Société Médicale des Hôpitaux, Vol. XLVI, No. 23, p. 1016.]

This clinical pathological report of a classical Dercum syndrome is of interest in its confirmatory evidence of the greatly enlarged sella turcica.

Armstrong, C. N. PITUITARY TUMOR AND FROEHLICH'S SYNDROME. [Brain, Vol. XLV, No. 1, p. 113.]

Three cases are here described as instances in which Froehlich's syndrome was present in definite form associated with unusual types of tumor in the base of the brain. In none was the pituitary the original seat of the tumor. In two the tumor was a cystic ependymoma, and in the third a cyst with large amounts of cholesterol. The general view of mechanical disturbance of the pituitary nerve pathways as being primarily involved is supported by these observations.

Plaut, R. METABOLISM STUDIES IN OBESITY AND DISEASES OF THE PITUITARY GLAND. [Deutsches Arch. f. klin. Med., 1922, CXXXIX, 285, Med. Sc.]

The authoress has studied the basal metabolism in various conditions leading to obesity, and has compared it with the figures as given in the tables of Harris and Benedict (*A Biometric Study of Basal Metabolism in Man*, Carnegie Inst., Washington, Publ. No. 279, 1919), and

has also investigated the specific dynamic action of food in these cases. The specific dynamic action can be decreased in cases of chronic undernutrition and in obesity. In undernutrition the decrease after food is a regulating mechanism which tends to conserve energy discharge. When the specific dynamic action is low, independent of the condition of nutrition of the patient, laying on of fat takes place, and this is seen in diseases of the pituitary and especially in dystrophia adiposogenitalis. Plaut thinks that the specific dynamic action of food is connected with the hypophysis, and as the result of her experiments believes that it is possible to distinguish by carefully conducted metabolism experiments between obesity of thyroid origin and one of constitutional or pituitary origin. She gives the following differential table:

	<i>Basal Metabolism.</i>	<i>Specific Dynamic Action.</i>
Undernutrition	Normal or decreased	Decreased
Pituitary obesity or constitutional obesity	Normal	Decreased
Pituitary cachexia	Decreased	Decreased
Myxedema and thyrogenic obesity	Decreased	Normal
Basedow's disease	Increased	Varies with condition of nutrition
Cachexia	Increased	?
Constitutional emaciation	Normal	Increased

Knipping, H. W. PITUITARY OBESITY. [Deutsche med. Woch., Jan. 5, 1923, XLIX, No. 1. J. A. M. A.]

Knipping continued on nineteen patients Plaut's investigation of the specific dynamic action of food in obesity. In most of these patients, although not all, other signs of pituitary disturbance were present. In two of them a preparation of the anterior lobe of pituitary was administered, and an increase of the specific dynamic action of food resulted. Two dogs with a partially destroyed anterior lobe showed the same influence of the preparation.

Veit, B. PATHOLOGICAL ANATOMY OF THE HYPOPHYSIS. [Frankf. Zeit. f. Path., XXVIII, 1.]

A contribution to multiple endocrine sclerosis in its relationship to hypophysial cachexia and to hypogenital adiposis. The clinical history is of a thirty-eight-year-old man with marked thirstiness, insomnia, loss of eristicism, later polyneuritic extremity pains, increasing weakness, thinning, dryness of the skin, atrophy of prostate and testicles, xanthelasina, low blood pressure. After six years he died. Autopsy revealed sclerotic atrophy of the entire endocrine system. Total loss of chromophil cells in the hypophysis; it was fetal in type and middle and posterior lobes were sclerotic. It was interpreted as a primary defect.

The cachexia was related to the anterior lobe defect, the hypogenital adiposity to the posterior lobe defect. The entire body responded by the sclerosis of the endocrine system. [J.]

Baldauf, Leon K. TUMOR OF THE PITUITARY, REPORT OF CASE. [Kentucky Medical Journal, Sept., 1922, XX, No. 9.]

The following case is reported because of its unusual interest. Mr. W. S. B., aged fifty, farmer and plasterer. Complaint, impaired vision in the right eye. Family history negative. Past history negative. Present illness dates from August, 1921, when a gradually increasing drowsiness developed. Patient at present may go to sleep at 6 P.M. and awaken at 6 A.M. fairly refreshed but ready for another nap after breakfast. This condition continues throughout the day. In spite of this lethargy, he has gained over thirty pounds. The impairment of vision in the right eye, slight at first, has now become marked. The patient complains of a peculiar discomfort in the head. Localized by him it is bitemporal to occipital. There is no severe pain, but there is an ache, described by him as a dull headache. He has never vomited; urinates frequently and drinks considerable water. A complete examination was made. Only the essential points in the examination will be mentioned. Patient well nourished. The increase in weight since August, 1921, has been particularly noticeable. Patient is very nervous and is somewhat irritable. The family say that at times he is very excitable. This is unusual for him. Gross eye tests show a right temporal hemianopsia. He urinates frequently but the urine is amber colored, has normal specific gravity and except for a few pus cells is negative. He has a tender prostate not particularly enlarged but denies gonorrhea. There is no suggestion of a diabetes insipidus. X-ray examinations of the skull laterally show a sella turcica much enlarged, deepened with probably some erosion. Although good films were obtained, the sella was indistinct and indefinite in places. The other laboratory findings were negative, although blood sugar determinations have not been made. With these main points in mind: (1) drowsiness, (2) increase in weight in such a short time, (3) right temporal hemianopsia, (4) increase in size of the sella turcica, (5) nervousness and irritability, (6) sexual impotence, a diagnosis of pituitary tumor was made and operation advised. [Author's abstract.]

Cummins, J. D. HYPERPLASIA OF THE HYPOPHYSIS CEREBRI. [Royal Academy of Medicine in Ireland, May 11.]

J. D. Cummins reported a case of hyperplasia of the hypophysis cerebri in an unmarried woman aged thirty-three, who had amenorrhea, progressive stoutness and lethargy, bitemporal hemianopsia, and unequal impairment of central vision; there was no enlargement of the sella turcica. Disharmony between the hormone-producing organs was held to be the cause; and complete cure was effected within five months by the

administration of one grain of thyroid extract daily. The president said that two years ago he had shown a somewhat similar case at the Academy, a woman, aged fifty-five, who was suffering from all the symptoms of a pituitary tumor, and was shown by X-rays to have a definite enlargement of the sella turcica; there was almost complete blindness of the right eye, and blindness of the nasal half of the left eye. He treated the patient first with pituitary extract, and later, for a period of six months, with thyroid extract, and, although he did not attribute the improvement to these remedies, it was a remarkable fact that this patient was now practically well.

Priesel, A. A FURTHER CONTRIBUTION TO THE KNOWLEDGE OF THE DYSTOPIA OF THE NEUROHYPOPHYSIS. [Beitr. z. path. Anat. u. z. allg. Path., 1922, LXX, 209.]

Reference has already been made to a case of dwarfism investigated by the author which was due to dystopia of the posterior lobe of the pituitary body (*Medical Science*, 1921-2, V, 251). He has now observed two further cases of a similar dystopia in otherwise normally-built subjects. The cases are, however, important as no similar ones appear to have been so far described. [C. da Fano, Med. Sc.]

Romero. OBESITY. [Cron. Méd., XXXVII, No. 689.]

This study emphasizes a relationship between obesity and the unconscious, either as indicative of inability to control the gratification of eating or the relationships between unconscious factors and parental form and figure. An extremely thorough and exhaustive examination of the patient, writing down his replies to questions, serves among other things to establish a confidential intimacy between physician and patient, arousing interest, ambition and encouragement as the progress realized is appreciated. He regards obesity as a disease of which weakness of the will is one of the main factors. Instead of the patient being a passive element in the treatment, as in other diseases, he must be taught and inspired to cure the disease himself. The main obstacle to the success of Romero's treatment, he says, is the prejudices and discouragement from other members of the family, and sometimes from other physicians, with which the attending physician and the patient have to contend.

Grove, W. H., and Vines, H. W. C. CALCIUM DEFICIENCIES: THEIR TREATMENT BY PARATHYROID. [British Medical Journal, May 20, 1922.]

The authors divide the diseases amenable to parathyroid treatment into: (1) Chronic toxemias, including (a) ulcerative conditions, like varicose ulcer, gastric ulcer, duodenal ulcer, erosion of the cervix uteri and gumma; (b) suppurative conditions, like nasal sinusitis, tonsillitis, pyorrhea, otitis media and bacilluria; (c) nonsuppurative, like rheumatic diseases, rheumatoid arthritis, osteoarthritis, chronic rheumatism, arterio-

sclerosis, eczema, chlorosis and sciatica. (2) Conditions of uncertain cause, like menorrhagia, prostatic hypertrophy and urticaria. All these various conditions have two common factors; a chronic toxic state, and a deficiency in the ionic calcium of the serum, due perhaps to a combination of calcium and toxin. Most of the cases reveal a primary septic focus and frequently a parathyroid therapy causes a hidden focus to become apparent by increasing the leucocytic reaction to the attacking microorganism. Parathyroid glands have a double function: first, regulation of calcium metabolism, and second, to render certain toxic substances harmless. It is possible that continued absorption of toxins may eventually lead to partial parathyroid insufficiency and a resulting disturbance of calcium metabolism, which together lessen the resistance of the tissues, rendering them more liable to secondary septic processes. The authors conclude, therefore, that the ionic calcium of the blood becomes deficient in a chronic toxemia and therefore the septic focus must be sought and treated. Where such a condition exists, healing does not commence until the ionic calcium of the blood approximates the normal figure. Parathyroid therapy rectifies the calcium balance of the blood much more effectively than does the injection of calcium salts. Parathyroid substance is not a specific, but it renders the tissues more capable of performing their normal functions and of combating the effects of toxic processes.

Klamperer, P. PARATHYROID HYPERPLASIA AND BONE DESTRUCTION IN GENERALIZED CARCINOMATOSIS. [Surg. Gynec. & Obst., 1923, XXXV, 11. Med. Sc.]

A detailed account is given of a woman, aged forty, who had had both breasts removed eighteen months previously for carcinoma. She returned to hospital with multiple metastases in the skeleton. There was a profound anemia, and after three months' stay in hospital the patient died. On post-mortem examination there was extensive growth in the bones, so that the spine in its whole extent could be cut easily with a cartilage knife. There was extensive bone destruction in the femur, cortical substance, and epiphysis. Owing to the amount of bone destruction a careful examination was made of the parathyroid glands. These were normal, excepting that in the place of the left inferior parathyroid gland there was an oblong kidney-shaped body 30 by 5 by 3 mm. in size, which was yellow in color and dense in consistency. Microscopic section revealed widespread adeno-carcinoma, and in the vertebrae there were areas of almost complete destruction of the bone with very little osteoplastic activity. The newly-formed osteoid tissue showed a complete absence of calcified tissue. A detailed account is given of the histological examination of the parathyroid glands and the large body which was removed showed a real hyperplasia. Serial sections through the pituitary gland showed that the posterior lobe and the intermedial zone were almost fully destroyed by tumor growth, but the anterior lobe was unaffected. The

author points out that it was notable that the destruction of the posterior lobe of the pituitary was not associated with any changes in the urinary secretion. He also lays stress upon the fact that hyperplasia of the parathyroid glands has been found in cases of osteomalacia and other conditions of bone destruction, such as osteitis fibrosa and osteoporosis. His case would fall into line with these findings since the parathyroid showed a true hyperplasia; but he regards the hyperplasia as an increased functional activity tending to compensate for a disturbed calcium metabolism, and extensive bone destruction. At the same time, however, he states that it is remarkable that the osteoid tissue in his case did not show more extensive calcification. He therefore regards the hyperplasia as a fruitless attempt of the body to compensate for the calcium deficiency.

Jacobson, C. EFFECT OF PARATHYROID TETANY BLOOD ON MOTOR NERVES. [Am. Jl. of Phys., February, 1923, LXIII, No. 3. J. A. M. A.]

The results obtained by Jacobson are interpreted as supporting the theory of a chemical change in the tetany blood directly affecting nerve excitability. But before such data can be accepted as proving this point, Jacobson says it must be shown that the results are not due to temperature change in the transfused leg.

Greenwald, I. THE ALLEGED RELATION BETWEEN ALKALOSIS AND TETANY. [Jl. Biol. Chem., 1922, LIV, 285. Ed. J. A. M. A.]

The trend of the normal processes of metabolism is to produce acid substances, so that the problem of neutrality regulation involves, above all, effective elimination of acids. In acidosis, this capacity may become jeopardized. Owing largely to the writings of D. Wright Wilson and his co-workers,¹ the view has gained ground that at times there may arise a condition designated as alkalosis, in which the blood and consequently other tissue fluids attain an unduly alkaline condition. There is here an implication, at least, of an increase in the hydroxyl ions of the blood as an expression of the abnormal variation in the acid-base balance of the circulating medium. It has further been taught that at such a juncture there is a hyperexcitability of the neuromuscular mechanisms of the body, which may frequently be demonstrated by the lowered threshold of electric stimulation, and may even result in manifest tetany. Wilson found that injections of acid relieve the symptoms of the tetany attending removal of the parathyroid glands, and concluded that the alkalosis which he believed to exist was overcome by the acid. Furthermore, attention was directed to the occurrence of tetany after intravenous administration of large doses of alkali, notably soda solutions. Cases of gastric tetany in

¹ Wilson, D. W., Stearns, T., and Janney, J. H., Jr.: The Effect of Acid Administration on Parathyroid Tetany, *J. Biol. Chem.*, 1915, XI, 169. Wilson, D. W., Stearns, T., and Thurlow, M. deG.: The Acid-Base Equilibria in the Blood After Parathyroidectomy, *ibid.*, 1915, XXIII, 89. Wilson, D. W., Stearns, T., and Janney, J. H., Jr.: The Excretion of Acids and Ammonia After Parathyroidectomy, *J. Biol. Chem.*, 1915, XXIII, 123.

which pyloric obstruction is attended by loss of acid gastric juice through vomiting, or in which the acid thus secreted cannot enter the intestine and be returned to the circulation, have been put into the same category on the hypothesis that a surplus of base may remain in the blood.

Greenwald of the Harriman Research Laboratory attached to Roosevelt Hospital, New York, has vigorously attacked the theory that alkalosis is the cause of tetany in any of the illustrative instances just mentioned. He cites the evidence offered by several investigators² to show that in fact there is no change either in alkalinity or in carbon dioxid-combining power after parathyroidectomy. Even after administration of large doses of sodium bicarbonate with consequent tetany, marked changes in the blood have rarely, if ever, been demonstrated. The retention of carbon dioxid becomes so large that the reaction is changed only slightly. According to Greenwald, the tetany, instead of being due to alkalosis, is attributable in such cases to the high concentration of sodium salts. When convulsions appear after the injection of sodium carbonate or bicarbonate, the concentration of sodium in the plasma is the same as when convulsions appear after the injection of sodium chlorid or sulphate. All sodium salts injected in large excess are toxic and, apparently, several of them are about equally toxic. In each case, there is produced a sudden and marked disturbance of the relation between sodium ions and other cations. Osmotic pressure plays a part, and the nature of the anion is not without significance. The toxic action, according to Greenwald, may depend on the ability of the sodium ion to penetrate the cell and thus upset the ionic equilibrium therein, or it may depend on its being unable to penetrate while combined with an anion that does, and in that manner damaging the cell by virtue of the electrical disturbance thus produced at the surface. But whatever the precise mechanism may be, he adds, there seems to be little doubt that the convulsions following the injection of sodium carbonate are due to what Greenwald³ has called "sodium poisoning," a disturbance, attributable to excess of sodium ion, of the normal relations between this and other cations.

These newer criticisms of the widely accepted alkalosis theory of tetany aver that such convulsions are not due to any single cause. Any one of a multitude of disturbances in the equilibrium within certain tissues may be responsible. Convulsions are to be regarded as a sign of approaching or partial disintegration of the neuromuscular apparatus. The defect may occur in any one of several structures, and may be due to any one of many causes, according to Greenwald's interpretation. At any rate, the subject now invites further investigation; and it is of paramount importance in medicine where the problem of rational therapy of tetany is concerned.

² Hastings, A. B., and Murray, H. A., Jr.: *J. Biol. Chem.*, (March) 1921, XLVI, 223. Underhill, F. P., and Nellans, C. T.: *J. Biol. Chem.*, (Oct.) 1921, XLVIII, 557.

³ Greenwald, I.: *J. Pharmacol. & Exper. Therap.*, (May) 1918, XI, 281.

Dragstedt. PARATHYROID TETANY. [J. A. M. A., Nov. 4, 1922.]

This bit of medieval humoralism maintains that parathyroid tetany or depression is due to an intoxication. The responsible toxic substances come chiefly from the gastro-intestinal tract. They arise through the activity of the proteolytic group of intestinal bacteria, and are probably for the most part protein split products of the nature of amines. The function of the parathyroid glands is to prevent intoxication by these poisons. The parathyroid glands do not furnish a hormone necessary for life, and dogs may be kept alive indefinitely after their removal, if treatment directed to the prevention of this toxemia of intestinal origin is carried out.

II. SENSORI-MOTOR NEUROLOGY.

1. CRANIAL NERVES.

van der Hoeve, J. OPTIC NERVE AND ACCESSORY SINUSES. [Arch. Ophthal., May, 1922.]

In this paper, read by invitation at the meeting of the American Academy of Ophthalmology and Otolaryngology at Philadelphia, October 19, 1921, the author says that attention has to be fixed on: (1) The diagnosis of the optic nerve disease; (2) the diagnosis of the sinus affection; (3) the relations between those diseases; (4) the treatment.

1. The optic nerve disease in sinus affection can be choked disc, papillitis, atrophy, and retrobulbar neuritis. The most difficult for diagnosis and the most frequent is the retrobulbar neuritis. The most typical symptoms are discovered by the examination of the visual field, and the most characteristic signs are central scotoma and enlargement of the blind spot. We do not know why the first loss of function appears in the peripapillar and papillomacular fibers of the optic nerve, but it is a fact. Both scotomata begin as relative, *i.e.*, for colors only, whereas later even the white light is not observed. If they enlarge the scotomata can flow together and cause the well known oval scotoma, including and surrounding as well the fixations point as the blind spot. As a rule enlargement of the blind spot appears first.

These are symptoms of a retrobulbar neuritis, not of a sinus disease. Every retrobulbar neuritis can begin with these symptoms, whatever its cause may be. *The ophthalmologist has in the eye no sign at all to distinguish the origin of a retrobulbar neuritis.*

2. Diagnosis of an existing sinus disease, especially of a posterior sinus disease, is not always possible, even when X-rays are applied.

One of the best methods to examine the ethmoid with X-rays is that of Rhese, a method which gives us also excellent images of the optic foramen and the fissura orbitalis superior.

In not one of the nine known cases of mucocoele of the sphenoidal

sinus was the diagnosis made before the opening of the sinus. *The rhinologist cannot say with absolute certainty that a person has no sinus affection.*

3. In two cases of tumors of the posterior nasal sinus with central scotoma during several months the result of the histological examination was quite different. Birch Hirschfeld in his case found the typical degeneration of the maculopapillar fibers; de Kleyn and Gerlach, on the contrary, in their case report no change in the optic nerve. This is typical for the clinical processes in the optic nerve in sinus affection, for we know we must distinguish two forms, one which improves directly after opening the sinus, the other in which improvement does not take place, or only partially.

We must distinguish in sinus affection:

(a) Reparable optic nerve affections, which can exist for months and months, caused by toxins, edema, congestion, slight inflammation, slight pressure; and

(b) Irreparable optic nerve changes, caused by toxins, degeneration and atrophy, following the same processes as mentioned above, but in stronger degree.

The following ways in which a diseased sinus can affect the optic nerve are possible:

(a) By direct spreading of the inflammation, as is shown in a case of pansinusitis, histologically examined by de Kleyn and Gerlach.

(b) By pressure by the walls of a dilated sinus, as we see in the cases of mucocoele, where every nerve in the neighborhood may become atrophic by pressure.

(c) Deleterious influence may be exercised by toxins, edema, congestion, etc.

4. In cases of retrobulbar neuritis in which a sinus disease is present this ought to be treated beginning with conservative methods. If another cause for optic nerve disease is found, we still must examine the sinuses carefully; then it may be that in the same time, with a multiple sclerosis, diabetes, syphilis, tuberculosis, etc., an independent sinus disease is present to, or a sinus disease caused by syphilis, tuberculosis, or rheumatism may be the direct cause of the optic nerve disease or an adjuvant. If there is a retrobulbar neuritis, and no cause can be found, then we may *not* content ourselves with the idea it may be multiple sclerosis, because this is the most frequent cause of retrobulbar neuritis and this can precede every other symptom of the multiple sclerosis ten and more years. When there is an optic nerve disease without any other symptom of multiple sclerosis, then for us the patient has no multiple sclerosis; at least we cannot perceive it. In those cases rhinologist and ophthalmologist have to consult together after thorough examination of the patient, whether the sinuses must be opened or not, therefore they have to weigh the possible advantages and disadvantages of the operation

in every special case. We know that in those cases sometimes success is obtained by opening the sinus, if a not diagnosticized sinus affection is found, and even in some cases though the sinuses are not diseased.

Van der Hoeve pleads for histological and bacteriological examination of material, which the rhinologist obtains at operation, and for dressing up statistics of the results of the operation both as to the restoration of vision directly after the operation and the after results, as to results of damage done to the nose and of statistics of what happens with the eyes of patients with optic nerve disease of unknown origin, if the sinuses are not opened.

In a publication on the same subject in the *Klinische Monatsblätter für Augenheilkunde*, Bd. 68, p. 691, van der Hoeve says in a postscriptum that up till now we do not yet know which paths the nerve fibers in the optic nerve follow. He shows that Leber's idea, that if the peripheral fibers of the optic nerve come from the peripheral parts of the retina, the central fibers from the central part, a complete crossing of all the fibers on the papilla would be inevitable, is not right. We do not even know anything about the size of the maculopapillar bundle; we thought it to be one-fourth to one-third that of the papilla. Igersheimer thinks it is only one-tenth to one-fifteenth, and we cannot prove anything about it, because it is possible that central scotoma exists without any microscopical degeneration or, on the contrary, an important degeneration of the bundle without central scotoma. Van der Hoeve says that in glaucoma the scotomata are not always connected with the blind spot; nay, that it is possible that an arcuar scotoma (so-called Bjerrum scotoma) is complete except the part at the blind spot. The typical arcuar Bjerrum scotoma can begin at every point of the arc between the raphe retinae and the blind spot, and does not always reach the blind spot. The central scotoma in retrobulbar neuritis and other neurogene scotomata may be, but are not always, connected with the blind spot. [Author's abstract.]

Flatau, Edouard. A NUCHO-MYDRIATIC PHENOMENON. [*Revue Neurologique*, Vol. 37, p. 1007.]

During an epidemic of cerebrospinal meningitis Flatau had his attention drawn to the fact that when the head of a sufferer from this disease was bent forward on the chest the pupils would dilate, returning to their original size when the head was held erect. Sometimes the dilatation would persist for from two to three minutes. The phenomenon was singularly constant and might be elicited at any time during the illness and even in chronic cases two or three months after the primary attack. A parallelism between the phenomenon and the signs of Kernig and Brudzinski is suggested. The phenomenon is also obtainable in cases of tuberculous meningitis, but as to its presence or absence in other meningitides the writer, from lack of sufficient experience, can give no opinion. There is one nonmeningeal infection, however, and one only as far as

he knows, in which the phenomenon is always present, namely, cervical spondylitis. In patients suffering from enteric fever, pneumonia, acute poliomyelitis, tabes dorsalis, tumor of the brain, and encephalitis lethargica the phenomenon is not manifested. The author quotes other work concerning the play of the pupils in response to external stimuli, such as pinching the skin, muscle strain, and loud sounds, and discusses the cortical and sympathetic theories. He believes that the nucho-mydriatic phenomenon is due, not to excitation of the skin, but to the pain induced by movement of the cervical vertebrae.

2. PERIPHERAL NERVES.

Heissen, F. SIMPLE ACROPARAESTHESIA. [Klin. Woch., December 9, 1922; B. M. J.]

F. Heissen describes the clinical features of simple acroparesthesia, and records two severe cases. In both cases severe attacks of a sensation of pricking and numbness in the legs, below the knees, occurred daily early in the morning. The author discusses the symptoms and etiology of the simple form of the affection, which, though not very rare, is not well known to medical practitioners. The application of warmth (warm bath or hot air) has a beneficial effect, and the patient is very sensitive to cold. The attacks are definitely related to excess of alcohol or coffee; the patients are less sensitive to tea and nicotine. Frequent associated symptoms are morning headache, superacidity, periodic attacks of diarrhea alternating with constipation, attacks simulating migraine or angina pectoris, tendency to sweating, urticaria, edema fugax, acrocyanosis. Two forms of acroparesthesia have been described—the simple form (Schultze's type) and the vasomotor or angiospastic form (Nothnagel's type). The terminal stage of the simple form of acroparesthesia is vascular paresis—acrocyanosis, with cessation of the paresthesia. The vasomotor or vasoconstrictor form may terminate in recovery, or gangrene may develop. In the simple form the symptoms are temporarily relieved by warm baths, while in the vasoconstrictor form the symptoms are increased thereby. The two forms are two diseases of different nature and etiology. The vasoconstrictor form is allied to Raynaud's disease, and may be regarded as the first stage of this affection.

Carter, H. S. CAUSALGIA AND ALLIED PAINFUL CONDITIONS DUE TO LESIONS OF PERIPHERAL NERVES. [Journal of Neurology and Psychopathology, May, 1922.]

The fundamental lesion is an intraneural and perineural sclerosis and the irritation set up at the site of injury causes perverted afferent impulses to be sent back to the cord and possibly further to subcortical and cortical centers, whence efferent responses of vasodilator, secretory, and trophic nature are reflected to the peripheral distribution of the nerve and inter-

puted as pain. It is difficult to say why lesions of the nerves which pre-eminently are affected, that is, the median and internal popliteal nerve fibers, produce a true causalgia in some cases, pain of less severity in others, and in the remainder nothing but the discomfort of partial sensory loss. It is improbable that inflammatory reaction to different groups of organisms is the solution. It is hardly possible that irritation of a special group of fibers is the cause. The most likely assumption is that in these cases there is some peculiarity in the nerve trauma which induces disturbance of those cells in the brain whose function it is to interpret pain. By resection of the irritated and sclerosed portion of nerve, the source of the perverted impulses is removed and the pain vanishes. By restoring the continuity of the nerve, the path for normal impulses is re-made and gradually recovers its conductivity as the nerve regenerates.

Jáuregui, P. DISSECTING NERVE FIBERS. [Rev. d. l. Asoc. Méd., July-August, 1922, XXXV, Nos. 213, 214.]

A technical surgical paper illustrating a method of moving the nerve bundles at the elbow to a region where it is less exposed to injury and strain, in treatment of fracture, neuritis, dislocation, etc.

Hughson, Walter. LOCALIZATION OF CUTANEOUS NERVES BY ELECTRICAL STIMULATION, APPLIED TO NERVE BLOCK ANESTHESIA. [Johns Hopkins Hosp. Bull., XXXIII, 338, 1922.]

Following a report on the use of electrical stimulation of cutaneous nerves as a new teaching method, the author applied the procedure to the localization of cutaneous nerves in nerve block anesthesia. The nerve trunks are localized by stimulation with a unipolar electrode, the distribution of the nerve being made evident by a tingling sensation. As large or small an area as required can be determined in this way. It has been shown that this method of localization is accurate to a distance of 1-2 mm. Further accuracy is obtained by fitting the hypodermic syringe with a set screw and using the needle as the stimulating electrode. When the needle point touches the nerve trunk the typical tingling sensation is felt and the injection of the anesthetic immediately produces complete loss of sensation in the area supplied by the nerve. Although there is some overlap, the anesthetized area is practically identical with the area determined by stimulation. The method is particularly suitable for such procedures as skin grafting or anything involving superficial incisions, but can be carried out on the deeper nerves with almost equal facility. Insulation of the needle is not necessary. (Two illustrations accompany the paper.) [Author's abstract.]

Policard, A., and Leriche, R. NERVE GRAFTING. [Lyon Chir., XIX, No. 5, September-October, 1922.]

The findings in a leg amputated two years after a grafting operation on the sciatic nerve with a nerve from a calf are here described in great

detail. The nerve elements had grown into the implant from below, but fibrous tissue had blocked completely the growth from the upper end of the nerve transplant.

Boorstein, Samuel W. CERVICAL RIB (WITH A REPORT OF SIX CASES, ONE OPERATIVE). [The Journal of Bone and Joint Surgery, Vol. IV, No. 4, October, 1922, pp. 687-704.]

In the article Boorstein endeavors to emphasize the advisability of considering cervical rib as a possible cause for shoulder disabilities or neuritis of the upper extremity. In reviewing the classification, he follows Gruber and divides them into four types, viz.: (1) A slight increase in the costal process, not reaching beyond the transverse process; (2) when the rib protrudes beyond the transverse process to a certain degree and either terminates in a free end or is attached in some way to the first rib; (3) those ribs which extend well beyond the transverse process and a considerable distance towards the first rib, even reaching the cartilage of the normal first rib—they possess a good body and are often united by a ligament to the first costal cartilage; (4) the rib which is completely developed, articulating with the first costal cartilage and with the sternum. He emphasizes the point brought out by A. S. Taylor, that many cases present an aponeurotic band which runs forward and downward to an attachment to the first rib. This aponeurotic extension causes the same symptomatology as does a false rib of similar extent.

Symptoms—Cervical ribs present two interesting groups of cases: (1) Those that have all the symptoms associated with this condition and yet have no cervical ribs, and (2) those that give symptoms and on examination prove to have cervical ribs. The symptoms are as follows: (a) Local symptoms—tumor, pain on pressure, bruit, etc. (b) Nervous symptoms—neuralgic pains moving down on the same side where the rib is present. Numbness, tingling, involvement of the ulnar nerve, analgesia may be present. (c) Vascular symptoms—pulsations, ischemia, edema, thrombosis, and aneurism. (d) Muscular symptoms—atrophy of certain muscles, the intrinsic of the hands, and of the thenar and hypothenar eminences; there may be atrophy of the entire arm; dysphagia and scoliosis. There are some cases on record in which dissociated sensory disturbance suggested syringomyelia.

Differential Diagnosis—The condition must be differentiated from (1) arthritis, (2) anterior poliomyelitis, (3) Erb's palsy, (4) subdeltoid bursitis, (5) scoliosis of cervical region, (6) callus formation from fracture of first thoracic rib or clavicle, (7) occupational neuritis, (8) transitory torticollis due to some nerve irritation, (9) exostosis of transverse process, (10) tuberculosis of cervical region, (11) neuritis. To facilitate differential diagnosis, Boorstein recapitulates by saying that "a cervical rib must be thought of in any case of sensory nerve symptoms along the distribution of the lowest brachial nerves, paralysis of the intrinsic muscles

of the hand, vasomotor changes in the hand, and tumor or subclavian pulsations in the region of a cervical rib.

Radiographic Findings—He calls attention to the fact that normally the X-ray shows that the transverse processes of the seventh cervical vertebra are shorter than those of the first dorsal vertebra. He advises stereos in every case.

Treatment—If there are no contraindications, radical removal should be considered. About the prognosis following the operation, gives the following guides: (1) The more pronounced and advanced are the symptoms, the less likely is the result to be a complete cure. (2) The more the nerves have been damaged by the rib, the more are they susceptible to lasting damage from any traumatism at the time of operation. (3) If operation is delayed until more or less thrombosis has occurred in the arteries of the extremity, then the result must be far from satisfactory. (4) When a complicating neuritis involving the entire plexus is present it might well be advisable to enforce rest and treatment until the neuritis has largely subsided before removing the rib, since operation during the active stage would undoubtedly cause post-operative aggravation of the pain, and the nerves would be more susceptible to damage in other respects.

Methods of Operation—Boorstein advocates the procedure of A. S. Taylor, quoting him from his paper on cervical ribs in N. Y. State Journal of Medicine, March 1922. In the case reports, he gives the histories of six patients (one operative). The symptoms of the operative case were: A medical student, age twenty-two, with a history of two months' duration, swelling of the right upper extremity, often cyanotic, cold, often sensation of stiffness, tired feelings very quickly, discomfort in writing and excessive use, numbness in the fingers. No pain. X-ray showed an enlarged transverse process of CVII. At operation it was found that the rudimentary rib extended about one-third inch beyond the posterior tubercle of the transverse process and was a broad plate of bone which extended downward almost to the neck of the first true rib. From its tip and lower border strong fibrous bands stretched forward and downward to the first true rib. The rib was removed and the patient made a perfect recovery.

Boorstein's conclusions are as follows: (1) Many cases coming to the orthopedic surgeon with shoulder trouble may be due to cervical rib. (2) Cases presenting following symptoms, pain, especially on motion, cyanosis, and atrophy of the limb, and no limitation of motion, should make one suspicious of a cervical rib. (3) The fullness of the supra-clavicular fossa, besides the X-ray, should help in the diagnosis. (4) The removal of the rib should be practiced by the orthopedic surgeon for the same reason that he removes the transverse process of last lumbar. (5) Where symptoms have existed over a long period, and especially where paralysis and atrophy form part of the picture, removal of the rib will

stop the progressive increase of the symptoms, but may not result in the entire recovery of what has already been lost. This indicates the necessity for early diagnosis, and the desirability of good stereoradiographs of the neck in every case of persisting pain or lameness of obscure origin. (6) In all cases of shoulder trouble, X-ray of cervical spine should be taken, since, if the cervical rib may not be the sole cause, it may be a contributory cause by interference with the circulation and nerve supply. [Author's abstract.]

Megaw, J. W. D., and Banerji, R. N. TWO FAMILY OUTBREAKS OF EPI-
DEMIC DROPSY TYPE OF BERIBERI. [Indian Med. Gaz., LVIII, No. 2,
February, 1923; J. A. M. A.]

The twelve cases reported by Megaw and Banerji occurred in a highly cultured and well-to-do Bengali family consisting of thirteen members belonging to three generations; the ages varied from eight to eighty. The first cases began to occur early in November, 1919, and by the beginning of January, 1920, twelve members of the family had been affected to a greater or less extent, the victims being attacked one by one at varying intervals. The most striking manifestations of the disease were gastro-intestinal symptoms which occurred in ten out of twelve. There was diarrhea in eight and dysentery in one. There was tenderness in the epigastric region, in three cases followed by considerable vomiting. There was slight nausea or vomiting in seven others. There was swelling of the feet and legs of varying severity and duration in all the cases. Fever of an irregular type occurred in eight cases. The temperature was seldom higher than 101 F. and in the milder cases the fever was slight and of brief duration. A systolic bruit, best heard over the pulmonary area, was detected in ten of the cases, and in four of these there were definite signs of dilatation of the heart accompanied by dyspnea. There was reduplication of the pulmonary second sound in two cases. The knee-jerks were exaggerated in ten cases, and were entirely lost in two cases. There was tenderness of the calf muscles in three cases; in one of these it was very pronounced and this case ended fatally. In one case the gait was like that of locomotor ataxy. A striking feature of the disease was a tendency to hemorrhages of which the following were noted: (a) Petechial skin hemorrhages in three; (b) bleeding piles in two; (c) epistaxis in four; (d) hematemesis in three; (e) hemoptysis in three; (f) hemorrhagic retinitis in four.

Leriche, R. NEUROMAS IN PATHOLOGY OF LIMBS AND VISCERA. [Lyon
Chir., XIX, No. 5.]

Cicatricial neuromas of the minute branches of nerves, according to the evidence here presented, may cause pathological conditions in the viscera or the extremities. As such neuromas occasionally induce serious disturbance in amputation stumps, so they may entail internal disturbances.

3. SPINAL CORD.

Boveri, P. DISSOCIATION OF ELEMENTS OF CEREBROSPINAL FLUID. [Policlinico, Vol. XXIX, No. 3, p. 1001; J. A. M. A.]

Boveri remarks that in affections involving the meninges the increase of albumin in the cerebrospinal fluid generally parallels an increase in the number of leukocytes. In some conditions, however, there is divergent behavior of the albumin and leukocytes. This dissociation is pronounced in Pott's disease and with compression from an intraspinal tumor, and Boveri has found it as an early sign of lead poisoning. His present communication is to call attention to the excessive albumin content with a primary tumor of the cerebral meninges in a woman of fifty-five. For four months she had been having frequent dizziness, vomiting and somnolency, and finally transient loss of consciousness and subdelirium on rousing. The left eye showed congestion of the retina, and the urea content of both blood serum and spinal fluid was high. The albumin in the cerebrospinal fluid was over 2 per thousand, but there was no lymphocytosis. The spinal fluid seemed otherwise normal. Nothing was found to explain these findings until necropsy about a week later. This disclosed an encapsulated tumor, as large as a pigeon's egg, back of the right occipital lobe. It was a very vascular endothelioma. In another case of meningeal tumor the albumin content was low while lymphocytosis was extreme.

Strauss. MISHAPS WITH INTRASPINAL ANESTHESIA. [Deut. Zeit. für Chir., Vol. CLXXII, No. 5-6, p. 285.]

A statistical study based upon an analysis of 22,717 cases in which intraspinal (lumbar) anesthesia had been applied, with a mortality of 1:2534 was made by this author fifteen years ago. In the past fifteen years he has compiled records of 83,698 cases, with mortality of 1:5978. He regards it as the only method for certain operations in diabetes, severe arteriosclerosis, cachexia, ileus, strangulated hernia, and for hard drinkers.

Valensi, J. Levy. REFLEXES IN LOCALIZATION OF SPINAL CORD LESIONS. [Paris Médical, Vol. XII, No. 27, p. 41.]

This is an interesting semeiological presentation of the various reflexes of the spinal cord, accompanied by simple and instructive illustrations.

Carniol, A. INTRASPINAL TREATMENT WITH INSOLUBLE SALTS. [Paris Médical, Vol. XII, No. 27, p. 44; J. A. M. A.]

Carniol remarks that therapeutics does not seem to have profited by the intraspinal route. He ascribes this to the difficulty of introducing an actually effectual dose of the drug on account of the fear of grave reactions. Another reason is the extreme shortness of the period of contact of the drug with the tissues, and a third reason is that the circulation of the blood in the meninges is almost entirely independent of the nerve

substance. The drug injected passes at once through the vessels in the meninges into the general circulation. Absorption into the blood by the meninges is rapid and vigorous while the circulation of the cerebrospinal fluid is very slow, if there is any at all. The only means to insure the continued action of the drug injected intraspinally is to use a drug that is not absorbable. His experiments with dogs showed that insoluble salts were borne better than the soluble. This encouraged clinical trials, and calcium was tried in epilepsy and mercury in general paresis. The research was begun in 1916, and the epileptics who had been having from two to five seizures a day did not have any more for from five to eight days. After this the seizures returned, but much less frequent than before. They gradually grew more numerous until the former frequency had returned. No sedative action was observed in four women with chronic mania, which confirmed that the calcium ion acts only on the motor nerve substance. All he can say of his cases of general paresis is that the reaction was minimal to intraspinal injection of 0.005 and 0.007 gm. of mercury salicylate, and the calomel seemed to be borne better.

Bloch, R. and Hertz. INTRASPINAL ANESTHESIA. [*Presse Méd.*, Feb. 7, 1923, XXXI, No. 11; *J. A. M. A.*]

These authors cite further experiences of their own and of others which confirm, they say, the advantages of intraspinal injection of caffeine in case of syncope from intraspinal injection of procain. It answered the purpose perfectly in eleven of the thirteen cases in which it was applied after failure of artificial respiration and subcutaneous injection of caffeine. In the one fatal case the syncope occurred after hysterectomy as the table was lowered to the horizontal. Intraspinal injection of 0.1 gm. of caffeine revived the patient, but only temporarily, and a second injection had no apparent effect. The others, all with extreme syncope, recovered after intraspinal injection of from 0.25 to 0.37 gm. In prophylaxis, they mix 0.15 gm. of the procain preparation with 0.12 gm. of caffeine and 0.15 gm. of sodium benzoate (to dissolve the caffeine).

Lundie, C. A CASE OF ACUTE MYELITIS OF UNKNOWN ORIGIN. [*South African Med. J.*, 1922.]

The case occurred after a chill caught by a man of fifty, previously in good health. Acute bronchitis first appeared and before this had cleared up nerve symptoms made themselves manifest first through a feeling of numbness in the hands and feet. When first seen, on the fifth day of the illness, examination showed no marked loss of thermal or tactile sensation, nor of the strength of hand grip. Knee-jerks, however, were completely gone and the Argyll-Robertson pupil was present, as was also Romberg's sign and a very ataxic gait. A diagnosis of locomotor ataxia was made and a bad prognosis given, but not one of very early death. A specimen of blood was taken for a Wassermann

reaction. Arrangements were made to take patient to see a nerve specialist but the rapid development of the case prevented that and compelled a revision of the diagnosis. Seen that same evening patient was obviously worse. He was no longer able to stand, his cough had now lost its tone and his arms and legs were distinctly enfeebled. On examination the cause of lost tone of cough was seen to be partial paralysis of the intercostal muscles which were scarcely acting at all. For the same reason expectoration of sputum was very difficult. Next day he was obviously too weak to travel as far as to the best nerve specialist so he was taken to the nearest nursing home for the specialist to see him there. Vocal cords on examination were seen to be acting feebly but not completely paralyzed. By this time intercostal breathing was completely abolished and expectoration practically impossible from this cause. He died two days after admission through waterlogging of lungs in spite of atropin injections to prevent this. Wassermann result received after his death was *slightly* positive. Nerve specialist's provisional diagnosis was encephalitis lethargica.

Lebermann, F. PAIN SENSE IN PATIENTS WITH ORGANIC NERVOUS DISORDERS. [D. Zschr. f. Nervhik., Vol. LXXV, Nos. 4, 5.]

The disagreement between the results of clinical and chemical tests of the pain sense which was manifest is considered of diagnostic value for the functional nature of the disturbances. The chemical tests allow the pain sensibility to be distinguished from disturbance caused by unobserved touch.

Ranson, S. W., and Wightman, W. D. VASODILATOR FIBERS OF DORSAL ROOTS OF SPINAL CORD. [Am. Journ. of Phys., LXII, No. 2; J. A. M. A.]

Ranson and Wightman believe that the evidence clearly demonstrates that the sensory fibers are capable of conducting antidromically impulses which cause vasodilatation and that they play an important role in the vascular reaction which accompanies inflammation. It has not been demonstrated, however, that vasodilator impulses normally leave the cord by way of the sensory fibers of the dorsal roots. Such vasodilator impulses as play a part in the depressor reflex from central vagus stimulation pass through synapses of sympathetic character and are interrupted by suitable doses of nicotin. If, then, the sensory fibers conduct dilator impulses antidromically in the depressor reflex, it becomes necessary to locate synapses of sympathetic character through which these impulses pass. It has been demonstrated by the use of nicotin that such synapses are not present in the periarterial plexuses or anywhere at the periphery and the most probable location for them is the spinal ganglion. It is known that the spinal ganglion does contain axonic ramifications in the form of pericellular plexuses which closely resemble those found in the

sympathetic ganglions. The possibility cannot be excluded that pre-ganglionic vasodilator fibers may leave the spinal cord by way of the dorsal roots to end in the spinal ganglions or that they may reach these ganglions by way of the sympathetic from the ventral roots of thoracic or sacral nerves.

Williamson, R. T. THE VIBRATING SENSATION IN DISEASES OF THE NERVOUS SYSTEM. [American Journal of the Medical Sciences, Vol. CLXIV, No. 5, p. 715.]

The author records the result of his own observations in clinical work, during the last seventeen years, on the vibrating sensation in various diseases of the nervous system. The sensation was tested by a large tuning fork $7\frac{1}{2}$ inches long (A. 440) with an oval metal footpiece. When the foot of a vibrating tuning fork (similar to that just mentioned) is placed firmly in contact with subcutaneous bony prominences or surfaces, in many parts of the body a peculiar vibrating sensation is felt. Suitable points for testing this sensation are the inner surface of the tibia, the malleoli, the anterior superior iliac spine, the nail of the big toe, the sternum, and styloid process of the ulna. In diseases of the nervous system the vibrating sensation is often the first form of sensation which is lost. In many diseases it is lost when other forms of sensation (for touch, pain and temperature can be felt. In diabetic neuritis very frequently any stage. Hence the vibrating sensation is often of value in differential diagnosis, and occasionally in localization of spinal diseases.

In multiple peripheral alcoholic neuritis and diabetic neuritis, the vibrating sensation is lost very early, at a period when sensations for touch, pain and temperature can be felt in diabetic neuritis very frequently the vibrating sensation is the only form of sensation lost, even in severe cases. In both alcoholic and diabetic neuritis in the legs, four important early symptoms are: pain, tenderness of the calf muscles, loss of the tendo achilles jerks and loss of the vibrating sensation. The vibrating sensation is often of service in the diagnosis between multiple peripheral neuritis and anterior poliomyelitis (acute or chronic) if both legs are paralyzed, since it is never lost in anterior poliomyelitis, but is usually lost early in peripheral multiple neuritis, though other forms of sensation may be felt. The vibrating sensation is of service in the diagnoses between anterior poliomyelitis and acute disseminated myelitis, or myelitis not limited to the anterior horns of grey matter; if the vibrating sensation is lost the lesion is not limited to the anterior horns of grey matter. At the early stage of combined posterolateral sclerosis or degeneration, the chief symptoms of diagnostic value are often (1) loss of the vibrating sensation on the legs, (2) slight ataxia or affection of the muscular sense in the legs, (3) an extensor type of plantar reflex. In disseminated sclerosis the most common form of sensory impairment is loss of the vibrating sensation, and often it is the only form of sensation lost until

a late stage of the disease. In this disease the vibrating sensation may be lost on the legs only, or on the legs and abdomen, or on the abdomen only. In such cases the abdominal reflexes are usually lost and the plantar reflexes of the extensor type. At the very early stage of "compression myelitis" from vertebral caries, or meningeal spinal tumor the vibrating sensation is lost before other forms of sensation, and the same is true in many cases of Erb's form of spinal syphilis.

The vibrating sensation is occasionally of service in the differential diagnosis between hysterical or functional anesthesia, and anesthesia due to organic disease and between organic and functional hemianesthesia. In the normal condition, when the foot of the large vibrating tuning fork is placed firmly in contact with a subcutaneous bony prominence or surface, the vibrations are felt not only at that point but at all other parts of the bone, though with varying and diminishing intensity. In a case of anesthesia of localized area, if one part of a bone, such as the sternum or tibia, should be in the area of anesthesia, and the opposite side or end not in the area of anesthesia, then if the foot of the vibrating tuning fork be placed firmly in contact with the part of the bone in the anesthetic area, though the vibrations may not be felt there, they should be felt at the opposite side or end of the bone (in the nonanesthetic area). If this should not be the case, the anesthesia is due to hysteria or malingering (providing the tuning fork vibrations are sufficiently strong and cause the vibrating sensation to be felt all over a bone in a nonanesthetic part in the same patient). [Author's abstract.]

6. ENCEPHALITIS.

Spanò, Rocco. CONTRIBUTION TO THE CASUISTIC AND ETIOLOGY OF THE EPIDEMIC ENCEPHALITIS. [La Pediatria, fasc. IX, Vol. 29.]

The clinical case the author speaks about concerns a girl six and one-half years old, of Naples, stricken by a strange disease characterized by an elevated temperature (39–40°), progressive weakness, loss of knowledge and speech, and a state of sleepy drowsiness interrupted by cries and lamentations and by stretching of the limbs. In this state the girl remained for almost twenty days, presenting the following symptoms: Hollowed eyes obstinately half shut, strained face, skin and visible mucous membranes pale and dry, sunken abdomen, arrhythmic and intermittent pulse, conspicuous hypertonicity of the limbs, exaggerated reflex of the knee, general hypersensibility, strongly dilated pupils slowly reacting to the light and accommodation, angioparalytic phenomena; the lumbar puncture gives exit to a limpid liquid which comes out spouting; the chemical and microscopic examinations of it result completely negative. In the following days these symptoms began to diminish. There was noted besides a progressive improvement, and on the forty-eighth day of her stay in the clinic she was dismissed almost completely healed,

there remaining only a slight disturbance in her speech and walk. The diagnostic idea could, after some uncertainty at the beginning, be addressed toward the epidemic encephalitis. In fact, cultures prepared from the spinal fluid on Tarozi-Noguchi medium have given growth to the gram-negative micrococci, having all the characteristics of the germ found in this disease by many American authors and by Maggiore and Sindoni in Italy. On account of the clinical analogy of the manifestations, the bacteriological and anatomopathological issues, the author thinks probable the hypothesis of Maggiore and Sindoni and other observers of the same etiology of the epidemic encephalitis and the Heine-Medin disease. [Author's abstract.]

Abely, Xavier and Charuel. EPIDEMIC OF LOCALIZED NEURAXITIS (ENCEPHALITIS.) [Revue Neurologique, Vol. 37, Nos. 7-8.]

A peculiar epidemic of myelitic type of localized neuraxitis occurring in the mental hospital at Châlons-sur-Marne. There were eighteen cases and the symptoms were astonishingly uniform. Digestive disturbance and slight irritability marked an incubation period of one week. Then followed intractable vomiting and prostration, attended by a moderate degree of fever, lasting about forty-eight hours. Finally, as the most characteristic feature of the epidemic, came complete paralysis of all movements of the trunk. If the patient were raised in bed, as when feeding, and then released, he fell back heavily. His trunk was an inert mass; head and neck were often involved, while in striking contrast movements of the limbs were usually spared. Occasionally there was some dyspnea. The tendon and cutaneous reflexes were normal or slightly weakened, excepting the abdominal reflexes, which were abolished. There was no sphincter, trophic or vasomotor disturbance, no oculomotor weakness and no definite somnolence. The cerebrospinal fluid showed an excess of glucose as sole change. The paralysis above mentioned gradually passed off and in three weeks' time full recovery had taken place. The epidemic lasted from January to April, 1921; persons already weakened from other causes were specially prone to infection and they were of all ages. The authors regard the disease as a form of *encephalitis lethargica*.

Monakow, C. v. GENERAL CONSIDERATIONS ON ENCEPHALITIS. [Schweiz. Arch. f. Neurol. u. Psych., X, 3. Med. Sc.]

In the present paper some general considerations on the infectious nonsuppurative type of encephalitis are expounded. This type or group includes various forms, some of which have been long known; for instance, the acute hemorrhagic polioencephalitis of Wernicke, the encephalitis from diphtheria, and syphilitic encephalitis. Others have been properly described only in recent years; such are the encephalitis associated with acute poliomyelitis, influenza, scarlet fever, chorea, rabies,

chlorosis, and herpes. General paralysis and disseminated sclerosis are now considered as special forms of encephalitis, and epidemic encephalitis is at present of outstanding interest. As etiological factors of these various forms many cocci, bacilli, spirochetes, spirils, and filter-passing viruses have been described. Whether they reach the central nervous system through the nasopharynx, the tonsils, the upper respiratory tract, or the lymph and blood stream has not as yet been fully established. The degree of alteration and reaction of the nervous structures varies according to the nature, biological properties, and point of entrance of the etiological agents, individual power of resistance, etc. The changes are generally subdivided into successive, but not sharply distinguished, phases or stages.

The central nervous system is protected from injury by various structures and mechanisms. Nonsuppurative encephalitis is, on the whole, an inflammatory process taking place almost exclusively within the ectomesodermic barrier. It can be subdivided into two principal types. The first is essentially parenchymatous and characterized by a rather diffuse involvement of the whole brain associated with edema, congestion, punctiform hemorrhages, diminished consistency of entire nervous regions, in particular of the medulla oblongata, pons, and grey nuclei of the basis cerebri. The pia mater is generally congested, but otherwise little affected; the ventricles are moderately filled with a clear fluid, though the choroid plexus may be swollen and hyperemic. The vena magna Galeni and the veins of the brain stem are engorged but rarely thrombosed. Some cases of encephalitis from influenza, the encephalitis of chorea, rabies, typhus, scarlet fever, herpes, and chiefly epidemic encephalitis belong to this type, of which two subdivisions are observed; in one, the brain substance is directly and diffusely affected; in the other, indirectly through the small blood vessels of large but not sharply defined districts. In the second case, the pathological manifestations chiefly take place in the floors of the cerebral ventricles, and grey substance about the Sylvian aqueduct, optic thalamus, and corpus striatum, viz: the districts in most intimate connection with the choroid plexus. The microscopic pictures include exudation and perivascular infiltration with lymphoid cells and red blood corpuscles, associated, in later stages, with various products from degenerating nerve cells and detritus of all sorts. In acute cases the exudative and infiltrative phenomena are accompanied by atrophy, degeneration, and necrosis of nerve cells, with consequent neuronophagia and rarefaction of the nervous tissue.

The other principal type of nonsuppurative encephalitis is characterized by a focal distribution and delimitation of the process. In this type there is a more deep involvement of the blood vessels and the formation of fairly well defined areas of softening variously situated, but more frequently found in the white matter of the brain, the internal capsule, the pons and the cerebellum. As opposed to the epidemic variety the localization is in poorly vascularized areas. This type is found in

poliomyelitis, in the encephalitis complicating ulcerative endocarditis, diphtheria, and syphilis, in the hemorrhagic encephalitis of Wernicke, and particularly in the true focal encephalitis from influenza. The atherothrombotic basis of this last form is, according to the author, well established: he does not, however, exclude an associated, diffuse parenchymatous degeneration of brain substance through the agency of toxins. The formation of thrombi explains the intermittent progression which is a characteristic feature of this form. These thrombi are, as a rule, greyish-white, and attached to eroded or otherwise altered endothelial surfaces. At the thrombosed place the lumen of the affected blood vessel is generally completely obliterated, although the thrombus may be reabsorbed or give rise to a great number of small emboli, which are then found occluding the smallest vessels and dilated capillaries. The brain tissue, thus deprived of blood, undergoes degeneration at first, but becomes in course of time the site of an intense proliferation on the part of the neuroglia. [C. D. Fano.]

Secretan, A., and Hedinger, E. PARKINSONISM AFTER ENCEPHALITIS. [Schw. med. Woch., 1922, No. 38.]

A young girl of fifteen years of no particular hereditary or antecedent history was taken ill in March, 1920, with fever and meningeal type of an encephalitis. In the beginning there was agitation and insomnia, then somnolence and lethargy. After five weeks there were no signs except some slight stiffness of the legs, and slight paresis in the facial musculature. The tendon reflexes were active. During four months there was a stationary period; one noted the inexpressive face and stiffness of the lower extremities. On her entry into the hospital in September, 1920, the neurological status was as follows: Inexpressive facies, ironed-out brow, right divergent strabismus, diminution of convergence reaction, paresis of right facial, monotonous speech, Kernig, increased muscle tonus, no ease in passive movements, voluntary movements slow, laborious and incomplete. Small step gait, hesitating, bent, the arms held to the sides. Fine tremors of the hands on voluntary movements. Diminution of automatic and associated movements. Active reflexes, no Babinski, no sensory disturbances. Lumbar puncture gives pressure of 14, lymphocytes 9.7, glucose 0.96. Nonne and Wassermann negative. The condition went on progressively to death in December, 1921, twenty-one months in all. The hypertonicity increased from head to foot. Sleepiness gradually increased. She could be aroused in order to eat; she would forget to chew, holding the food in her mouth without swallowing or rejecting it. Bulbar symptoms appeared. Mastication and swallowing became more difficult, speech nasal and dysarthric, abundant salivation. Large oscillatory tremors of the entire body developed, especially to command movements and finally continuous. Intelligence unimpaired. Death from cachexia and pseudobulbar involvement. Autopsy by Hedinger showed marked sclerosis of locus niger, and the

right and left globus pallidus with calcification in the latter. The author considers the evolution as continuous throughout, first due to an inflammatory process, their central lesions of a cicatricial nature producing a Parkinsonian syndrome. [Author's abstract.]

Scripture, E. W. SPEECH IN BULBAR PALSY. [Rev. Neur. and Psych., XVII, 456.]

The author states that bulbar speech has the following characteristics: weakness, initial bellow, indistinctness, nasalization, huskiness, rattling tone, blurring, slowness, slight deficiency of rhythm, and sometimes slight monotony. These signs may not all be present in mild cases, but they develop sooner or later. In bulbar speech there is asthenia, or weakness of the muscular action. There is also ataxia, or improper coördination. There is also, as in all speech troubles, the effort to combat the defects. If the results of such an effort are indicated by the prefix "an," then the formula for bulbar speech will be "asthenia+anasthenia+ataxia+anataxia." Records of bulbar speech are illustrated in the article and much is claimed by the author for their value in diagnosis and the investigation of the disease and in priority of this form of study. [Atwood.]

Kling. EPIDEMIC ENCEPHALITIS. [Norsk. Mag. f. Laeger, LXXXIII, 843.]

This report to the first Scandinavian neurologic congress in Copenhagen presents observations on epidemic encephalitis in a sparsely settled part of Lapland. The settlements there were so far apart that it required about one day to go from one to another, and this wide separation of the population facilitated the study of the epidemiology. Kling found that the transmission is directly from person to person, that the incubation period is ten days, and that abortive cases in which catarrhal symptoms predominate are frequent. By inoculation of rabbits, the virus was demonstrated to be present in the nasopharynx of well persons who had been in contact with the sick. Altogether, Kling studied 120 patients, of whom twelve died, and he believes that he has isolated the virus, which is a filterable virus, pathogenic for rabbits but not for monkeys. In rabbits the virus produces a chronic disease with specific changes in the brain. The observations of Levaditi and Harvier in Paris, and of Straus, Loewe and Hirschfeld in this country, are not accepted as dealing with the specific virus of epidemic encephalitis. In the case of the French investigators it is possible that the virus they used was the virus of ordinary herper (not herpes zoster), which Kling claims can be separated from true encephalitic virus by immunologic tests, the serum of encephalitis patients restraining the action of the encephalitis virus but not that of the herpes virus. The complete reports will be awaited with interest. Finally, it is noteworthy that Kling regards epidemic encephalitis as having existed for a long time without having been recognized as a distinct disease.

A similar study (Hygeia, Nov. 15, 1922) abstracted (B. M. J.) further relates: C. Kling investigated on the spot an outbreak of epidemic encephalitis in the north of Sweden, where, early in 1921, the epidemic assumed alarming proportions. In the four villages in which every person was examined it was found that, by the inclusion of slight and abortive cases, the morbidity ranged from 7.1 to 45 per cent. In certain families several members were simultaneously affected, and the abortive cases were characterized by the same prodromal symptoms (fever, catarrhal symptoms, headache, tenderness of the scalp, and "rheumatic" pains) as the fully developed and typical cases. The abortive cases were in the majority, and were doubtless chiefly responsible for the rapid spread of the infection. No evidence of infection by indirect means—that is, by milk, water, or insects—could be demonstrated. The spread of the epidemic was remarkably rapid; in the course of two months it had spread over an area of 87 square Swedish miles, populated by about 9,000 persons. In three cases in which the incubation period could be determined with accuracy, it was invariably one of ten days. About 100 cases, including 12 which terminated fatally, were subjected to a bacteriological examination. All the 30 inoculations of the virus into monkeys proved negative, but rabbits proved susceptible, although the disease was not acute as in man, but was of a chronic, slowly progressive character. The characteristic changes in the brain did not, as a rule, appear till three to five months after intracerebral infection or injection of the virus into the anterior chamber of the eye. When the virus was contaminated with cocci a mixed disease was provoked, and the rabbits died in four to eight days with signs of acute inflammation of the brain. It was evident, however, that they harbored the specific virus, for by filtration and other devices it was possible to isolate the virus from these cases of mixed infection and to induce uncomplicated encephalitis in other rabbits. The author has succeeded in passing the virus from one rabbit to another through eight generations in the course of eighteen months, during which the toxicity of the virus was gradually raised.

Volpino, G., and Racchiusa, S. INFLUENZA AND EXPERIMENTAL ENCEPHALITIS. [Ann. d'ig., XXXII, 721. Med. Sc.]

A form of subacute encephalitis was obtained in rabbits by subdural inoculations of the glycerinated expectoration of three typical cases of influenza. The fresh expectoration was collected in sterilized bottles, washed with water in order to eliminate the salivary keratogenous virus of Levaditi, and then kept in pure glycerol from five to fifteen days. Control experiments were made with the expectoration from apparently healthy subjects and from cases of lung tuberculosis and pneumonia. After a period of incubation of three to five days the inoculated animals became affected with a disease lasting ten days and characterized by symptoms similar to those of lethargic encephalitis. The histological examination of the brains of the affected rabbits revealed the existence of an

inflammatory process characterized by nerve-cell degeneration associated with neuronophagia, parenchymatous and perivascular infiltrations chiefly consisting of "mononuclear cells" of the lymphocytic type. Polymorphonuclear leucocytes were not seen. In the cytoplasm of a considerable number of nerve-cells large eosinophil bodies were found, which, judging from the colored plate illustrating this paper, have a striking resemblance with Lipschütz's intranuclear α -, β -, and zoster-bodies (Medical Science, 1922, VI, 313). The bacteriological investigation of the brains of the affected rabbits was attended by negative results. Control animals either died of acute infections or remained apparently healthy. The glycerinated virus used by the authors is neither filter-passing, nor keratogenous, nor transmissible in series to other animals. [C. D. Fano.]

III. SYMBOLIC NEUROLOGY.

1. PSYCHONEUROSES.

Wright, G. J. TREATMENT OF PSYCHONEUROSES. [Am. Jl. Psych., April, 1924.]

The majority of the neuroses and psychoneuroses as seen in an active neuropsychiatric practice are benign and open to relatively easy approach and cure. Wright holds that method of treatment is naturally one of reëducation and readjustment. In the pernicious or malignant cases the same methods are advisable, but some of these cases are so complex in their development that a disproportionate amount of time and effort is required, and such patients should be referred to men specializing in this direction.

Giese, F. INVESTIGATION OF PRACTICAL INTELLIGENCE. [Zschr. f. d. ges. Neurol., Vol. LIX.]

The author makes a report of intelligence tests which depart from the old routine of test merely of the formal thought processes. Giese's tests are arranged in a series of methods containing in all forty tests. There are three divisions with a number of subdivisions. The tests are of a nature to effect a much broader stimulus to the intelligence and they afford therefore a much more practical test than the old methods could effect. Examples are as follows: I. Capacity for organization. The transporting of various practical objects a certain given distance; packing of a trunk or box as for a journey; performance of a number of commissions in the city with as little loss of time as possible. II. Practical combination. Displacement of a water level by a bottle filled perhaps three-quarters full of water—not an easy task for anyone. III. Practical attention. Choice of unaccustomed objects for certain things, *e.g.*, driving a nail with something else than a hammer. Choice of a candidate from personal characteristics, testimonials, etc. IV. Arithmet-

ical tests such as translating the ten system of counting into the five system, and the reverse.

Moersch, F. P. PSYCHIC MANIFESTATIONS IN MIGRAINE. [Am. Jl. Psych., April, 1924.]

Of 1,000 cases of migraine here cursorily analyzed, 15 per cent manifested mental symptoms, either directly associated with the attack, or in some manner related to the condition. The most common complaint was a mild mental and physical depression, a sense of apathy, dullness, drowsiness, fatigue, lack of energy, anxiety, general distress and fear of impending trouble. In twenty-two of these cases the psychic disturbances were so profound that they might well be considered as transitory psychic episodes. Only one patient showed any evidence of endocrine disturbance.

Miller, H. Crichton. PSYCHOANALYSIS AND THE SCHOOL. [Mental Hygiene, January, 1923.]

The term "psychoanalysis" is claimed to refer exclusively to the theory and technique laid down by Professor Freud; it is therefore better for one who cannot claim to be an orthodox disciple of the Freudian school to avoid it and substitute the term "analytical psychology." The fact that a group of educationists invites a doctor to address them on this subject proves that it is more than therapeutic in its application. Analytical psychology should have an infinitely wider function than the treatment of nervous disorders; its real value should be preventive; its application should be universal, and its justification should lie in the complete lack of employment of those of us who spend our time in trying to straighten out warped lives and to neutralize the effects of faulty education. It is the study of these failures in development that has brought home to our generation some of the fundamental principles of mental hygiene; and it is the teachers who have first to learn and then to apply these principles.

Analytical psychology means self-knowledge and straight thinking; and it signifies these two things to a degree never attainable before Freud and those who have followed him made it possible to investigate the unconscious. What does this mean for the educationist? It means that the first application of analytical psychology for him lies not in the direction of analyzing his pupils, nor in a sudden facility in the use of psychological jargon to the irritation of the uninitiated; but rather in increased knowledge of himself and an increased capacity for observing and understanding his pupils. We recognize to-day that it is due to our manifold repressions that we cannot get to know our pupils. It is the complexes that produce our own mental astigmatisms that prevent us from seeing them in true perspective. When we have made contact with our own unconscious, we begin to recognize the difference between our *anima* and our *persona*, between our true self and the self we imagine we are,

between the subjective and the objective sides of our character. With this new analytical outlook we are able to detect that the stupidity of one pupil, the laziness of another, and the apparent viciousness of a third are but the objective manifestations of subjective maladjustments that cannot be cured by a direct attack, but require a much more careful subjective approach. Furthermore, it is only in the light of analytical knowledge that we can assess the factor of unredeemed childishness in ourselves; and until that knowledge has been achieved, how can we help our pupils to grow up?

Perhaps it is in the problem of discipline that analytical psychology has the greatest contribution to make. Methods of discipline are peculiarly apt to reflect the unconscious bias of the teacher. At one extreme is the rigid régime of the training ship type. Behind this one suspects the presence of an unresolved power urge. At the other extreme are the modern schools which claim that "the problem of discipline simply does not arise." If this is true, it can only be achieved by eliminating one factor in the problem: the social demand. Among the promoters of this method we are apt to find the rebels to social authority, whose zeal for freedom is based on a strongly personal, albeit an unconscious motive.

Another psychological failure to which analytical psychology may fruitfully be directed is the sense of status, the attitude of adult superiority which is often so marked as to prevent any vital contact between teacher and pupil. The trouble with this adult self-consciousness is that it does not proclaim itself in our dealings with the adult world, and therefore tends to escape correction at the hands of our usual critics.

In London our educational program at the Tavistock Clinic offers opportunities for teachers who wish to gain some insight into analytical psychology. The need for such courses of study is becoming more and more widely recognized. In conclusion let us remember that the failures of the teacher of to-day will come up for judgment by the analyst of to-morrow, who in his treatment of the adult patient will reflect how much poorer an opportunity is his than that of the teacher with the child whom he might have made into a man, but instead made into a neurotic. [Author's abstract.]

MacWilliam, J. A. APPLICATIONS OF PHYSIOLOGY TO MEDICINE. III. BLOOD PRESSURE AND HEART ACTION IN SLEEP AND DREAMS. [Brit. Med. JI., December 22, 1923; J. A. M. A.]

The results obtained by MacWilliam lead him to the conclusion that in considering the subject of sleep one must deal with two distinct conditions which have strikingly different associations as far as nervous, circulatory, respiratory, and other functions are concerned: (1) undisturbed or sound sleep, attended by lowering of blood pressure, heart and respiratory rates, etc., and (2) disturbed sleep, modified by reflex excitations, dreams, nightmare, etc., sometimes accompanied by extensive rises

of blood pressure, increased heart action, changes in respiration and various reflex effects. The circulatory changes in disturbed sleep are sometimes very pronounced. Night is not always the time of rest and sleep. This conception, while true as regards undisturbed or sound sleep, has to be qualified by the consideration that night and sleep are occasionally the season of acute reflex and emotional disturbances which, in the peculiar conditions present, induce very pronounced effects on the circulatory system, throwing a formidable strain on its weak points. In this way the individual may, during the nocturnal period of assumed repose, be subjected to suddenly developed stresses far beyond what is involved in ordinary muscular exercise gradually initiated. Thus, hemorrhages, the onset of anginal attacks, and other disturbances in the night can readily be accounted for; also sudden death, probably due to ventricular fibrillation in most instances.

Thom, Douglas A. HABIT CLINICS FOR CHILDREN OF THE PRE-SCHOOL AGE. [American Journal of Psychiatry, Vol. II, No. 1, July.]

This is a report of work done for the baby clinic association of Boston and supports with various case histories the thesis that we have much to learn of the problems of the pre-school child and of means of dealing with him. In some of the cases presented remarkable results were achieved. [Menninger.]

Christoffel, H. SIGNIFICANCE OF PSYCHOANALYSIS. [Schw. med. Woch., May 15, 1924; J. A. M. A.]

Christoffel attributes the lack of understanding of psychoanalysis among certain physicians partly to emotional causes (the shock to our self-complacency), partly to mental laziness. In grave psychic diseases the method may be valuable, especially in diagnosis and explanation of schizophrenic symptoms. Beginning paranoia or manic and depressive states may be favorably influenced by it.

Róheim, G. STEPPING OVER. [Int. Jl. Ps., Vol. III, No. 3.]

The author here refers to a preceding paper as an illustration of the effect of popular beliefs upon the development of a neurosis. Individual analysis and social anthropology have much to contribute to each other. In Dr. Sokolnicke's case the "child must not be lifted through the window because it will not grow any more." This was the nurse's statement, which in Mecklenburg has its analogue in the saying, "One must not pass a child through a window, or it will stop growing"; also "A person who is still growing must not step in or out through a window, unless he returns by the same way."

[In a compulsion neurosis partly analyzed by the abstracter, verified by the obsessive activity, "he could go out of a window from the inside, but not in from the outside," *i.e.*, birth through the mother was possible, but intercourse with the mother was prohibited.]

Röheim narrates a number of related beliefs current in German provinces, and also discusses other features of the child's obsessions about the "two hand notion." One must not step over a child because the child will not grow, or if such a calamity has inadvertently taken place one must undo the spell through stepping back over it in a reverse direction." This parallelism is not a matter of chance, the author suggests. The same unconscious meaning attaches itself to both procedures. It is thus seen that windows or the legs of a living person have an identical significance in popular belief. We naturally suspect that the house in this case represents a woman, the window represents a vagina, and passing through or lifting over represents coitus (see note of abstractor). Fear of "not growing" is a castration fear. Growing = erection. The boy's yes-no means the ambivalence of crossing over and back. Passing through the window = the desire of the penis to grow. Stepping over then means the possibility of coitus, and many anthropological parallels are cited by the author. These parallels are to be obtained from many widespread localities. He cites Anglo-Saxon, African, Hungarian, and other sources. Windows and thresholds have a related significance. "Carrying the bride over the threshold" as a symbol of potency may be cited. [J.]

Wright, Jonathan. THE MEDICAL FAKIRS OF ATHENS AND THE SEXUAL PROBLEMS OF BABYLON IN THE DAYS OF HERODOTUS. [N. Y. Med. Jl., September 15, 1923.]

We cannot but conclude from the study of the pages of history, reinforced by prehistoric evidence, that in the childhood of our civilization the juvenile minded portion of humanity had a wider expansion and received more deeply extended impressions from the innumerable processions, temporal and secular, triumphal and Bacchanal, funereal and supplicatory, patriotic and political, than has been the case for us in the more advanced nations of the earth in many hundred years. This sort of thing is an appeal to the minds of men through the emotions, moved in the crowd as they are and often leading to erroneous and harmful conclusions. It stirs the heart of man as it did that of Xerxes who fell into tears at seeing the mighty host he commanded spread out before his eyes at the Dardanelles, as it is related in the pages of Herodotus.

Some of the psychological influence thus released arouses the credulity of the mass of men confronted by the medical fakirs and fanatics who flock yearly in large numbers to the golden streets of the New Jerusalem in the western hemisphere as they did of old to Athens when a circuit rider of the sect of Aesculapius came to town and was welcomed by Sophocles, the head priest of a large congregation of the followers of the god. In Herodotus is seen how easily Peisistratus hoodwinked the Athenian demos with a woman dressed up as Athena led in a political procession advocating his candidacy. Such a trick a medical fakir tried, apparently

successfully, on the more sophisticated Athenians of the Golden Age when he entered Athens with his snakes.

Herodotus had his credulities, too, but Hippocrates had no use for snakes and he was born at Cos not far from Halicarnassus across the water, when Herodotus was a boy there of ten perhaps. When Hippocrates was about forty years old we were in the age when the Athenians laughed at snakes, but for all that they crawled around the temple wards. Side by side with Hippocratic science bloomed the absurdities and rascalities of medical charlatanry. Is it different in our day? We try to laugh down the various fake "sciences," but do we? Ridicule is considered a mighty weapon, but it is a flash in the pan that neither prevails nor endures in the face of truth or of error when supported by faith and fanaticism. Wit and ridicule are the wisdom of the foolish, sharpened perhaps but without temper in the blade or weight in the handle. We all draw the line somewhere and Herodotus drew it at the six foot woman of the deme of Pæania as Athene; that was merely silly.

Of these and many more Dr. Wright deals in this interesting paper.

2. EPILEPTIC STATES.

Nørvig, J., and Larsen, E. J. THE MECHANISM REGULATING NEUTRALITY IN ACIDOSIS. [Hospitalstidende, May 14, 1924; J. A. M. A.]

Nørvig and Larsen tabulate in minute detail the findings in eight febrile patients, in four with true diabetes, four with renal diabetes and one pregnant woman. The aim was to determine the changes in the ratio between the ammonia and the pH of the urine, which is a constant ratio in health, ammonia being the physiologic regulator of the acid alkaline balance. Intake of acids or of alkalis alters the ratio regularly in the corresponding sense, but there seems to be a difference in the result according as the acid is of endogenous origin or supplied from without. The increase in the ammonia content proceeds alike with both, although the pH drops with exogenous acid. The regulating mechanism is always abnormal in epileptics during or between seizures, even with intervals of months. In their thirty cases the findings were very irregular, and paradoxical in some. Contrary to the regular fluctuations with practically constant ratio in other conditions, in epileptics there seems to be a primary pathologic state of the regulating mechanism. The organism seems to lack the normal property of getting rid of the excess of acid or alkali. The production of ammonia is irregular; sometimes too much is produced and then not enough, regardless of the needs of the organism.

Lafora, G. R. MYOCLONUS AND AMYLOID BODIES IN THE NERVE CELLS. [Rev. Neur., November, 1923.]

Lafora claims priority of discovery of amyloid bodies within the nerve cells in myoclonic conditions. He says that chemically they seem to

have a constitution intermediate between amylaceous and hyaline. They may appear diffusely spread throughout the nervous system or be confined to a circumscribed region. The myoclonic syndrome seems to depend on the localization of changes in the striorubro-cerebellar or the thalamo-rubro-cerebellar tracts. The intracellular amyloid bodies are not fatigue products of the myoclonic contractions.

Rosett, J. MECHANISM AND FUNDAMENTAL CAUSES OF EPILEPSIES.
[Am. Arch. of Neur. and Psych., June, 1923; J. A. M. A.]

The investigation made by Rosett discloses a physiologic reaction in normal man and animals which consists of the following connected train of phenomena: (1) A temporary reduction, disintegration or extinction of the cerebral functions. (2) A tonic contraction of the entire skeletal musculature, with a certain predominance of the extensors, adductors and pronators; the consequent fixation of the joints resulting in the posture characteristic of the state of decerebrate rigidity. (3) Clonic muscular contractions, *i.e.*, alternating contractions of antagonistic groups of muscles. (4) Recovery, marked by symptoms of integration of the disintegrated cerebral functions and a state of general exhaustion. This reaction, in a more or less pronounced form, normally occurs under two sets of conditions: (1) On exposure to the action of a stimulus requiring sudden movement on the part of the organism, or the narrow focusing of attention and (2) in connection with certain functions, such as sleep, defecation, sneezing, coughing, parturition. The mechanism of this reaction is to be found in certain anatomic structures and physiologic functions underlying the production and distribution of muscle tonus in the nervous system. The biologic purpose of the reaction is the automatic fixation of the relatively central joints preparatory to any possibly needed movement of relatively distal segments of the body and limbs. The reaction is characterized by a periodicity of occurrence. The phenomena which constitute the normal reaction described, being in a great number of particulars the same as those which constitute the epileptic paroxysm, a suitable name for it would appear to be the normal epileptoid reaction. The normal epileptoid reaction is elicited with greater ease under the influence of the same agencies which cause an exaggeration of the epileptic paroxysm. An example of such an agency is the action of caffeine. On the other hand, influences which are potent in holding the epileptic paroxysm in abeyance, such as the action of the bromids and phenobarbital, have the power to diminish the manifestations of the normal epileptoid reaction. A slight and transient suspension of the higher functions, resulting as it does in a release of function of the lower levels, brings about the normal epileptoid reaction. Any factor, therefore, which operates permanently so as to cause large periodic suspensions of the highest nerve function, whether that factor be a brain tumor, a poison in the blood, a peripheral irritation or an inherited defect, will, by a

permanent exaggeration of the normal reaction, tend to degrade it to the clinical picture of the epileptic paroxysm.

Wieloch. CEREBRAL PRESSURE AS A CAUSE OF ECLAMPSIA. [Arch. f. Gyn., October 1, 1923.]

This study of 218 cases of edema, being 6 per cent of his total, brings out several interesting facts with reference to Zangmeister's cerebral pressure theory as a cause of eclampsia. He states that eclampsia rarely occurs without obvious edema, and in all cases edema can be found if careful examination is made. Albuminuria is not a necessary concomitant of eclampsia, but when present it always aggravates the edema and causes eclampsia to develop more quickly. The blood pressure is always raised in cases of eclampsia, and is the first symptom of increased cerebral pressure. The increased blood pressure was not directly connected with any kidney lesion, as it occurred in 29 per cent of cases of dropsy without albuminuria, one-third of which became preëclamptic or eclamptic; but in a way they are interdependent, since a kidney lesion aggravates any edema present and causes cerebral edema, the first symptom of which is increased blood pressure. As a proof of the above theory of eclampsia, the author states that: (1) The symptoms of eclampsia are those of increased cerebral pressure. (2) Lumbar puncture shows the pressure to be increased in the large majority of cases, absence of such increase being due to blockage of the foramen magnum by the edematous brain, in the manner of a valve. (3) On trephining cases of eclampsia cerebral edema was found. (4) Sections of the brain post mortem usually show edema, and a negative finding does not prove that it was not present during life. (5) Lumbar puncture or trephining, by lowering the cerebral pressure, mitigates or cures eclampsia. In conclusion the author states that eclampsia is the end result of a dropsical process, and therefore efficient treatment of the edema will ward off eclampsia or cure it when present. Intramuscular injections of gelatin and gum in Ringer's solution (5 to 10 per cent) in 10 to 20 c.c. doses is recommended, the albumin content of the blood being increased thereby. The presence or absence of a kidney lesion, which determines the prognosis, is bad in proportion to the albumin content. The prognosis is good if there is no kidney lesion, since the intact kidney can deal successfully with the edema present.

Pollak, E. PREDISPOSITION AND EPILEPSY. [Arb. a. d. Neurol. Inst. Wien, XXIII (H.1), 118; Med. Sc.]

In all forms of genuine epilepsy signs of a defective development of the central nervous system in general and of the cerebral cortex in particular can be found. These signs consist of the presence of nerve cells in the white substance of the cerebral cortex, imperfect delimitation of the grey layers from one another and from the white substance, trans-

position of certain grey layers, reduction in the number of nerve cells in single layers, and occurrence of immature and atypically formed nerve cells. In addition, various deviations from the normal myeloarchitectonic type are frequently observed in the cerebral cortex. These changes should not be considered as the immediate cause of epilepsy, but as the histological manifestation of a congenital weakness or predisposition with which other direct though changing factors may afterwards associate in bringing about the epileptic syndrome. This explains why epileptic symptoms are frequently observed in cases of disseminated and tuberosc sclerosis, atrophy of the cerebral hemispheres, various forms of encephalitis, etc. The author, however, is prepared to admit that no predisposition appears to exist in the case of epileptic fits occurring in certain affections of the central nervous system as, for instance, brain tumors. [C. da Fano.]

Pagniez, P. TOXICITY OF THE SERUM AND OF THE CEREBROSPINAL FLUID IN EPILEPSY. [La Presse medicale, 1924, XXXII, 45.]

Pagniez found that intracardiac injections of epileptic serum into guinea pigs produced generalized convulsions, followed by death. This observation was, however, rare. Among 15 male animals which received 2 c.c. of epileptic serum, only 3 presented marked symptoms. One of these animals had also received an injection of 4 c.c. of the serum. A few minutes after the injection the animal which had not presented an immediate and violent convulsive attack developed clonic contractions mainly affecting the muscles of the back of the neck, the trunk, and sometimes of the limbs. Of the 12 guinea pigs which did not have generalized convulsions, 9 presented myoclonic symptoms. Other authors reported similar observations. If it may be assumed that the symptoms produced by serum from epileptics are due to its action upon the central nervous system, injection into the carotid artery is the rational form of administration. When this route was employed, the injection was followed in a few cases by acute general convulsions and by death as was observed following intracardiac injections. In other cases, four or five minutes after the injection, the animal became agitated, frightened and coughed; these symptoms were followed by myoclonic contractions of the nape of the neck, the trunk and the limbs. The number and nature of these attacks varied with the serum injected, and with the sensitivity of the animal. In some cases the convulsive attacks were grouped into a series of contractions followed by intermissions of several minutes. The serum of nonepileptic individuals suffering from asthma, migraine, gout, saturnism, tuberculosis and general paralysis was injected into 21 guinea pigs; 18 failed to present convulsive symptoms, and 3 developed myoclonic symptoms, which were not severe. The convulsive effect of the serum was not limited to epileptic cases, but was exceptional in other cases and frequent in epilepsy. Pagniez found that the serum of the same patient was active at one time, and innocuous at another. In 12

cases in which serum was obtained following an epileptic attack, it was active in only 2 cases, and only weakly so in one of these 2. The serum was derived from 7 patients. The cerebrospinal fluid from nonepileptic individuals, injected into the carotid of guinea pigs, was devoid of any toxicity. The animal presented merely irregular attacks of shivering. Of 16 cerebrospinal fluids from epileptic individuals, 14 were no more toxic than were normal fluids; in 2 cases the injection was followed by typical myoclonic reactions. One of these fluids was derived from a patient six days after a epileptic attack, the other was withdrawn during the stuporous period immediately following an attack. It appears that the toxicity of epileptic serum varies according to the time of withdrawal and that it is least following acute attacks. The toxicity cannot be due to mineral constituents of the serum, or to its urea or uric acid content, inasmuch as the toxic element is thermolabile, and disappears completely on heating to 58° C. The citrated plasma has the same activity as the serum. It appears therefore that the toxicity is connected in some manner with albuminoid substances in the plasma, but is not identical with these substances, inasmuch as they are present in small amounts only in the cerebrospinal fluid which is also toxic. The toxic doses employed in the guinea pig experiments were ineffective when injected into rabbits. However, the guinea pig is not the only reactive animal, and the convulsive element exerts a heterotoxic effect. The reaction depends upon the toxicity of the serum, and also upon the sensitivity of the nervous system. [This type of research is highly speculative. The reaction capacity of lower animals is not at all understood now to be compared with human material.]

Muskens, L. J. J. MYOCLONIC EPILEPTIC ATTACKS. [Nedldsch. Tschr. v. Geneeskunde, No. 7, 1923.]

Muskens points out in detail that bromcamphor forms a means for bringing about convulsions in animals which agree extensively with myoclonic and regional convulsions in man. These may be investigated physiologically.

Zappert, J. EPILEPSY IN SMALL CHILDREN. [W. med. Wschr., 1923, No. 18.]

Zappert recommends luminal as a valuable substance in the treatment of convulsions and epileptic conditions in small children and to be preferred to bromid. It may be given prophylactically for years in small doses, perhaps 0.05 at first, decreased to 0.025, every evening if necessary and then less frequently. Bromid may be given in the ages from three-four years not less than 1 g. in marked tonic or clonic convulsions. Usually it need not and should not be given for any length of time. It may be given to advantage with the luminal. Salt need not be kept from the diet if bromid is not given. Sedobrol may be given because of its pleasant taste and because it relieves the limitation of salt.

Everke, C. OVARIAN EPILEPSY. [Mon. f. Geb. und Gyn., January, 1923; J. A. M. A.]

Everke reports the case of a woman, aged thirty-nine, who for five years had had epileptiform seizures every two weeks. For six months excessive uterine hemorrhages had much weakened her. On assumption of cancer of the uterus, panhysterectomy was done, and the seizures have never returned during the twenty years since. He has treated two other patients by ovariectomy, and neither has had any return of the convulsions. In these and in another case the convulsions were connected with menstruation and coitus interruptus. In the latter case, correction of the sexual life alone and the resulting pregnancy banished the seizures permanently.

Turner, W. A. EPILEPSY AND GUN SHOT WOUNDS OF THE HEAD. [Jl. Neur. and Psych., February, 1923.]

William Aldren Turner writes that sufficient time has elapsed since the war to reveal the later effects of gun shot wounds of the head. The records of the Ministry of Pensions (Great Britain) show that out of eighteen thousand men who received gun shot wounds of the head, eight hundred or rather less than 5 per cent have become epileptic. The percentage would probably be higher if minor epilepsy and epileptic equivalents of a vertiginous character were recognized and included. The cases may be divided into two groups: (1) those with a definite organic lesion of the skull, membranes and brain penetrating wounds; (2) those without injury to the skull (scalp and nonpenetrating wounds). Focal or Jacksonian epilepsy is relatively uncommon; it occurs early and tends to disappear; while the generalized type is common by comparison, of later development and runs a chronic course. In nearly all cases some change is to be noted in the mental condition. The outlook in the majority of cases of generalized epilepsy is unsatisfactory and the results of surgical measures are not encouraging. In view of the thousands of gun shot wounds of the head without epilepsy it looks as if something more than local tissue alterations is responsible for the seizures and in Turner's opinion it is an inherited or inborn constitutional predisposition to nervous instability and epilepsy.

Küttner and Wollenberg. ILL SUCCESS IN SUPRARENAL OPERATION IN EPILEPSY. [Ztbl. f. Chir., 1923, No. 11.]

The writers report briefly four cases of severe epilepsy in which the removal of one and one-half suprarenals was completely negative. In one case there was even change for the worse. They conclude that such operation is inadvisable.

Rodhe, E. LUMINAL IN EPILEPSY. [Acta Med. Scand., October 4, 1923.]

This author has used luminal since 1914 in many cases of epilepsy. He has followed up to the present about 30 cases. In petit mal the results

varied; when there were long intervals between the attacks treatment was usually effective, but when the attacks were frequent its action was slight. The dosage was from 0.1 to 0.5 gram distributed in several doses during the twenty-four hours, unless the case was one of nocturnal epilepsy or of early morning epilepsy, when a single dose of 0.1 to 0.5 gram was given at night. Though the attacks usually recurred when the drug was discontinued, the author records several cases exceptional in this respect. Only once has he known this drug cause severe signs of poisoning such as mania, but if pushed it may give rise to drowsiness and vertigo. It can often be given continuously for years, even daily, without giving rise to signs of poisoning; but should the patient show intolerance to the larger doses of either luminal or bromides a combination of small doses of the two is very effective. The author warmly recommends calcium bromide in this connection, having found its sedative and anti-convulsive action a useful adjunct to the narcotic action of luminal. In any case in which bromides are unsuitable luminal is indispensable.

Pezzali, A. THE BLOOD IN EPILEPSY. [Rif. Med., May 7, 1923.]

This study fails to note any special features of the metabolic findings in five epileptics tested before, during and after seizures. The nonprotein nitrogen and chlorids showed nothing characteristic. Only the cholesterol regularly decreased during the seizure and rose afterward, as likewise the fat to a less extent, while the glucose content was stable. The presence of indican suggested the advisability of regulating the digestive processes. The regular fluctuations in the cholesterol content indicate that this may have a protecting action, and that it might be advisable to give cholesterol treatment a thorough trial. The calcium content of the blood was found much higher during the attacks. This suggests treatment with organic calcium during the intervals.

Reichardt, M., Wuth, O., Spielmeyer, W., u. Rudin, E. THE PRESENT STATE OF RESEARCH ON EPILEPSY. I. CLINICAL. II. METABOLIC INVESTIGATIONS. III. ANATOMICAL. IV. GENEALOGICAL. [Ztschr. f. d. ges. Neurol. u. Psychiat., 1924, LXXXIX, 321; Med. Sc.]

In this series of papers four writers deal with different aspects of epilepsy. Reichardt discusses the nature of epilepsy and the question as to whether the epileptic fit should be regarded as symptomatic of various pathological processes, or as the characteristic expression of a specific disease. Before this question can be solved, we need to know more of the genesis and nature of convulsions in general. These present a distinct problem in cerebral physiology, and for purposes of exposition we may consider the convulsion to stand in a relation to cerebral activity similar to that of the extra systole to cardiac activity. Increasing attention is being paid to other than nervous tissues in connection with convulsions, but Reichardt believes that in the present stage of our knowledge

too much stress is being laid on disorders of ductless gland secretion in this connection. While these may stand in some causative relation to epilepsy, it is the brain which must be the primary object of research. He leans to the view that essential epilepsy—that is, an epilepsy which is the expression of purely endogenous factors (“Anlage epilepsy”)—is a diagnosis which can be reached only by a process of exclusion, and he gives a provisional classification of epilepsies. (1) *Physiological* (“Allgemeine Konvulsibilität”) including asphyxial, hemorrhagic, and toxic convulsions. “Convulsibility” varies from individual to individual, and both cerebral and ductless gland factors may be concerned. (2) *Epileptiform reactions* to various exogenous factors, including organic brain diseases, dependent upon individual predispositions. (3) Group of *essential epilepsies* (“Anlage epilepsien”), dependent upon congenital developmental abnormalities of the brain, or of ductless gland function. (4) *Epileptoid states* without well-defined fits.

Wuth deals with biochemical and metabolic investigations and concludes that so far these have provided no criteria by means of which we can differentiate an essential from symptomatic forms of epilepsy, nor any information as to the seat or nature of the process underlying the convulsion.

Spielmeyer discusses some aspects of the cerebral morbid histology of epilepsy. The pathological lesions may be divided into acute and chronic degenerative varieties. The latter include cortical gliosis and nerve cell degeneration, sclerosis of the cornu ammonis, and developmental abnormalities. The former comprise lesions of nerve cells and fibers, which present no features in any way characteristic of epilepsy in particular. The acute pathological changes fall into two groups. In one both nervous and neuroglial elements are involved together, and the glial lesions are not to be regarded as reactionary to parenchymatous lesions. The amoeboid glia cells described by Alzheimer fall into this group, and are now regarded not as phagocytic but as necrotic forms. The nerve cell lesions in this group are of the nature of a liquefaction. In the second group, the glia changes are reactionary and include karyorrhexis and syncytial forms. The nerve cell lesions include swelling of the cells, which may be present in all parts of the nervous system. Satellitosis is conspicuous, especially in the case of the large nerve cells of the cerebellum and in the cornu ammonis. These changes, which vary in intensity and in kind in different cases, present no features by which we may distinguish a symptomatic from an essential epilepsy, and they are found in traumatic epilepsy in general paralysis and in other diffuse cerebral degenerative conditions. Hence on microscopic investigation by itself a diagnosis of epilepsy cannot be made. In respect of *the chronic changes*, the cortical gliosis (“Randgliosis”) and the sclerosis of the cornu ammonis are no longer regarded as developmental anomalies. The former is a glial proliferation secondary to nerve cell loss and is found most

marked where cellular lesions are greatest. Here also the process is not specific for epilepsy and is to be found in all chronic central nervous diseases, while it may be wanting in brains of undoubted epileptics, even when sclerosis of the cornu ammonis is well developed. Developmental anomalies are common in epileptic brains, but similar abnormalities may be found in other diseases and even in brains from normal subjects. Hence, no more can be said of them than that they may predispose to the occurrence of epilepsy, as well as of other nervous diseases. Of all the brain lesions revealed by microscopic examination, Spielmeyer believes sclerosis of the cornu ammonis to be the most characteristic of epilepsy. It is probable that this region of the brain reacts readily to all pathological agencies, and is affected in many chronic nervous diseases, such, for example, as general paralysis and epidemic encephalitis. In epilepsy, a typical sclerosis of this portion of the cortex was present in about half the cases examined by Alzheimer, Bratz, and others, but it is doubtful if any grouping of epilepsies can be made on this basis. What relationship either acute or chronic changes in the cerebral hemispheres may bear to the convulsions is unknown.

Rudin, in discussing the rôle of hereditary and familial factors in the causation of epilepsy, finds that while these undoubtedly play a part in a certain proportion of cases, the precise importance and frequency of these factors require further statistical inquiries along modern biometrical lines. [F. M. R. Walshe.]

4. MEDICO-LEGAL; SOCIAL.

Dayton, N. A. OSTEOMALACIA IN IMBECILE WITH PSYCHOSIS. [Boston Med. & Surg. J., Jan. 4, 1923, CLXXXVIII, No. 1, J. A. M. A.]

Dayton cites the case of a woman, aged thirty-six (mental age about seven) who always had been peculiar and who had to be cared for throughout her life "like a child of three." She attended school until ten years of age, but made no progress. The psychosis was gradual in onset, dating from several months before admission, but a notable point was the rapidity of mental and physical deterioration from the onset of the psychosis. During her stay of about seven years in the institution, twenty-nine casualty reports were recorded. Twenty-two of these were minor injuries, the result of falls without apparent cause. That is, the patient fell because of inability to manage the lower extremities rather than from an impediment. Gross changes in the bony skeleton were noted, and a fracture of the left tibia and fibula confined the patient to bed. The patient died soon afterward. A necropsy was held and the findings are reported by Dayton. The bone changes were those of osteomalacia. The ovaries were interesting. They were considered as fibrotic ovaries with degenerated follicles, refuting the theory that osteomalacia is due to hyperactivity of the ovaries.

Mancini, M. A. COCAIN POISONING. [*Rivista Critica di Clinica Medica*, Vol. XXIII, No. 11, p. 121.]

The young man died a few hours after he had complained of intense pain in the heart region. It was learned then that he had been taking cocaine for some time. The dose had been the usual one, and Mancini suggests that the limit of tolerance had been surpassed or that the cocaine he had been previously using had been adulterated, and he had happened this time to get a pure article.

Wiedman, O. G. OBSERVATIONS OF A JUVENILE COURT PSYCHIATRIST. [*American Journal of Psychiatry*, Jan., 1923, II, No. 3, p. 459.]

The post of psychiatrist in connection with the juvenile courts presents numerous opportunities for contact with varied types of individuals, each with problems and needs characteristic of his group. The types may be classified as: (1) The individual delinquent group; (2) the family group, represented by parents, brothers, sisters and other relatives or guardians; (3) the legal group, including judges, probation officers, and other court personnel; (4) the institutional group, represented by officials and workers from various institutions and agencies. The psychiatric treatment of conduct disorders is of the greatest importance, inasmuch as the youthful delinquent is still in a plastic state, and may be cured of his delinquency. He responds more readily to readjustment and reformation than does the adult. If neglected, his nascent criminal tendencies will be developed, and he will join the class of definite malfactors. The examination of the delinquent includes physical, mental, neurologic, psychologic and social examinations. An effort is made to analyze the individual and the cause of his delinquency, and suggestions are made as to prognosis and treatment. The summarized report is submitted to the judge referring the case. Among first offenders (children) only about 33 per cent will be found to have mental defects or aberration. Psychiatric study facilitates the early recognition of feeble-mindedness, mental inferiority, psychopathic states, psychoneuroses, and psychoses, and is therefore of value in securing adequate and just treatment for offenders suffering from such disorders. Since the development of the probation system it is only the exceptional first offender who is summarily committed to an institution. Institutionalization may be indicated by the nature of the offense, or by the unsuitable character of the home, for the protection of the child himself. However, the widest scope of the work of the juvenile courts consists in the adjustment and reëducation of the child without removing him from the home environment. For this reason, psychiatric study of the home and family of the delinquent are important. Competent parents and a wholesome environment are potent factors in the prevention of delinquency. Children from good homes seldom make their first appearance in the juvenile court before the age of twelve years, when outside

factors are instrumental in the development of delinquent tendencies. In 72 per cent of the homes considered by the court to be unsatisfactory, divorce, death of one or both parents, desertion, feeble-mindedness, insanity, alcoholism, criminality, dishonesty, sexual immorality, cruelty, neglect, poverty, avarice and ignorance were the determining factors. The rôle of the psychiatrist, as regards the officials of the court, is to explain the determining factors of the case, and to lessen the tendency to ritualistic treatment of offenders. Similarly, the work of the probation officer, who is most concerned with the readjustment of the child to his social surroundings, requires an accurate knowledge of children in general, and of the individual child. Here the psychiatric method of study is of value. This also applies to the work of welfare organizations, institutions and agencies.

Brackenbury, H. B. THE INJUSTICE OF SOCIALISTIC LEGISLATION.
[J. A. M. A., 1923, Correspondence.]

In a letter to the Times, Dr. H. B. Brackenbury, chairman of the Insurance Acts Committee of the British Medical Association, points out this anomaly: Two patients require insulin. For one, an insured person, the physician can obtain any necessary supply, free of cost either to the patient or to himself. The other, a professional man of small means, must pay for the drug alone \$900 a year—a large part of his income—to keep himself alive, or else he must die. Meanwhile, as an employer, he is contributing to the fund by means of which the other man's supply is obtained, and as a taxpayer, he is paying his share of not less than two-ninths of the cost. Turning from this injustice, which in this case is a service to one of the persons concerned, a wasteful one might be added to the doctor's example. Pharmacists often remark that the quantity of dressings ordered by panel physicians is excessive. The panel physician, no doubt, has no desire to waste the money of the taxpayer, for he is one himself. But the direct and much greater stimulus to economy of having to pay for the article is removed, by the insurance act, from both him and the patient, with natural consequence. Thus, a panel patient will bring to the pharmacist's shop an order for four ounces of cotton wool. The next customer, a woman, whose needs may be the same or greater, will ask for the same quantity, and, on hearing the price, will say, "I will take only once ounce." Yet it is she or her husband who helps to pay for the waste which often occurs in the other case. Another example is the Employer's Liability Act, which makes an employer responsible for compensation to an employee, even though the accident is the fault of the latter. If the employer is a small man with some modest savings made for his family, that employee has a prior claim on such savings. It may be said that the employer can and does insure against this liability for a small annual sum. The reply to this is that his liability

still exists, for if the insurance company were to fail, he would be mulcted to the full amount.

Weichbrodt, R. SUICIDE. [Monat. f. N. u. P., 1923 Supplement.]

We have reviewed a recent book by this author and the J. A. M. A. presents an analysis of a recent article on the same subject. It is generally accepted that the struggle to live is instinctive and inherent in all living things, and that the primordial urge to maintain life is the fundamental factor in determining evolution. Suicide is therefore one of the most puzzling of mysteries, for it seems to subvert the most primitive of all cravings. As it occurs only in man, there is reason to seek the explanation in that factor which seems almost peculiar to man: his mind. Many, indeed, see in suicide only the evidence of a mind diseased. But this explanation does not suffice. Mental disease introduces no new instincts; it merely exaggerates old tendencies by removing controls and inhibitions that would keep them in check. Other psychologists have gone to the opposite extreme and suggest that the number of suicides may even be a measure of the degree of national culture. The really essential element of mind that permits the choice of death instead of life is undoubtedly foresight and anticipation, occasionally the imaginings of insanity, but more often the judgment of the actual facts.

A study of the statistics reveals glimpses of the numerous factors that enter into the formation of such judgments. The suicide rates for each hundred thousand of population for these last few years of kaleidoscopic changes are: Five-year average, 1911 to 1915, 16.3; 1916, 14.2; 1917, 13.4; 1918, 12.2; 1919, 11.2, and 1920, 10.2. The figures from the United States Census Bureau for the registration area (approximately 82 per cent of the total population) are not available for 1921 and 1922. But the Save a Life League reports the absolute numbers for those years in the whole country as over 20,000 and 13,530. These would mean a rate of about twenty and thirteen, respectively.

In a recent monograph, Weichbrodt has analyzed European figures and discussed some interesting factors. He points out the increase in the proportion of women who commit suicide that has come simultaneously with their assumption of more active responsibility. In the United States the ratio of men to women suicides has changed from 3.3:1 in 1916, to 2.7:1 in 1920. Comparative studies of the suicide rates among Catholics, Protestants and Jews lead to the conclusion that devoutness, and not the particular form of faith, is the important element. Bratz, presumably using the same figures, stresses the increasing tendency to individualism, with consequent loss of family and community ties, as an important contributing factor.

Recently there has been discussion of the supposedly greater frequency of suicide among physicians than among other professional classes. The figures compiled by the journal from its records for the years 1916 to 1922 are: 39, 31, 39, 38, 32, 69 and 56. The approximate number of

physicians during this period is from 158,000 to 160,000. Unfortunately, there are no figures available of other professions that would permit an actual comparison. But when it is realized that suicide is considerably more frequent among brain workers than among hand workers, there is little reason to assume that there is anything in the practice of medicine that conduces to suicide. The relation to employment already quoted suggests that it is lack of work and not overwork that most often leads to suicide. The rise in 1921 is entirely in accord with the general increase of suicide throughout the country.

Brown, W. RESPONSIBILITY AND MODERN PSYCHOLOGY. [*Psyche*, Vol. 2, p. 133.]

W. Brown regrets the tendency for a deeper knowledge of psychological laws to become a popular fad instead of a serious study, thereby encouraging an extremism foreign to the spirit of true science. Any suggestions that modern doctrines of psychology tend to weaken the sense of moral responsibility both in the criminal and in the judge is fallacious, since psychology is not concerned with the problem of responsibility, but merely attempts to trace antecedent factors of wrong doing in the criminal's heredity, previous mental constitution, and conditions of environment. Most wrong doing represents the failure of social instincts to control merely self-regarding instincts when such control is called for in the interests of the community, and is caused either by excessive strength of impulse or exceptional weakness of control, or by a disturbance of intellectual life preventing the individual from knowing what he is doing, all of which factors may contribute to the resulting act. While the legal definition of responsibility only recognizes the intellectual factor, it must be borne in mind that effective knowledge of an act must include knowledge of the circumstances in which it is performed. In addition to the many forms of mental illness to which such a criterion applies—for example, alcoholic mania, post-epileptic automatism, etc.—there is a class of individuals who suffer from overwhelming compulsion to criminal acts, as in kleptomania, the compulsion being so strong that normal powers of control are inadequate to hold it in check. Psychological analyses in such cases often point to the events and fantasies of early childhood and strong repression of infantile tendencies as being responsible, and the problem of moral responsibility resolves itself into a redistribution of responsibility among the right persons rather than towards its abolition. The psychoanalytical school, according to this author, errs in restricting its investigation to instinctive bases of mental life, and fails to do justice to the nature of volition or other higher forms of mental activity, and it can have no right to deny personal responsibility, because it has not yet even begun to deal with the concept of responsibility. While not contesting the reality of moral responsibility, modern psychology regards criminals who suffer from certain forms of mental disease as being less fully

responsible for their acts than normal people, but it in no way lends countenance to the view that all criminals suffer from mental illness or that such illness is an invariably sufficient excuse for crime. Since many forms of psychoneurosis are partly due to defective will, this may be strengthened and reeducated by mental analysis and suggestion.

Pearson, Karl. THE RELATION OF HEALTH TO PSYCHIC AND PHYSICAL CHARACTERS IN SCHOOL CHILDREN. [London Letter, J. A. M. A., June 23, 1923.]

Prof. Karl Pearson has completed for the Drapers' Company Research Memoirs a statistical investigation in which he reaches some interesting conclusions. Quoting Kipling's reference to "the flanneled fool" and "muddled oaf" (in a poem written during the war, denouncing our too great addiction to sport), Pearson says that he felt uneasy at the time about these lines, and endeavored to ascertain what, if any, was the relation between intelligence and success in athletics. The answer given by statistics is that the relation of athletic power to intelligence, if not intense, is significantly marked, and that it is the intelligent rather than the slow or dull children who exhibit athletic power. His other conclusions are not very encouraging to the schoolmaster. He finds that general intelligence and a variety of psychic characters remain unchanged throughout the whole range of school life. It is not possible for the teacher to modify them. It is not he, but the parent, who provides the metal; all the teacher can do is to give an edge and temper to it. General health changes very little during the whole school period. Health and intelligence are correlated, though not markedly. While recognizing this association, it does not seem feasible in the present state of medical knowledge to improve intelligence by modifying health. We are forced to recognize that, on broad lines, health and intelligence are innate characters chiefly controlled by inheritance. There appear to be no grounds for the widespread opinion that health is a governing factor in temperament. It is associated, but only in a minor degree, with certain psychic characters.

BOOK REVIEWS

Behr, Carl. DIE LEHRE VON DEN PUPILLENBEWEGUNGEN. [Julius Springer, Berlin. \$3.95.]

It is now over ten years since the section in the Willbrand-Saenger Handbuch dealing specifically with pupillary disturbances appeared, and as the present author, himself a pupil of these well-known coworkers in this neuroophthalmological field, has aptly stated much progress has been made during this time, new viewpoints have altered many older conceptions, and the liaison between neuropsychiatrist and ophthalmologist has become more and more intimate and important.

Hence this revision of the entire subject from the newer viewpoints. In this excellent work much emphasis has been placed upon the more typical forms of pupillary anomalies which come before the neurologist and psychiatrist, and yet these narrower interests, although accented, are not the exclusive features of the book, for internists, ophthalmologists, and general features of pupillary disturbances have all been considered.

Anatomical Foundations of Pupillary Movements are first laid down; then the Physiology of Pupillary Movements is considered, and followed by chapters on the Pathology of Pupillary Movements. A special section is then given to schemata of the Light Reflex Pathways and a final section upon the Methods of Examination of the Pupils. A sixty-page bibliography, arranged chronologically, from 1840 to 1920, completes this valuable study.

de Parrel, G. et Lamarque, Mme. Georges. LES SOURDS-MUETS. ETUDE MÉDICALE, PÉDAGOGIQUE ET SOCIALE. [Les Presses Universitaires de France, Paris. Fr. 35.]

A fascinating monograph of over 400 pages which presents almost every aspect of deaf-mutism in a detailed and valuable manner.

It is particularly serviceable to the social and medical worker and the pedagog whose life work is devoted to the care and training of this particular disorder.

We miss a comprehensive study of the pathology from the neurological standpoint, but apart from this defect the work is a mine of information and a most praiseworthy production.

Bing, Robert. LEHRBUCH DER NERVENKRANKHEITEN. Dritte Auflage. [Urban und Schwarzenberg, Berlin und Wien. Mk. 22.]

These "Thirty Lectures" appear in a new rewritten and enlarged form although following the general scheme outlined in the previous editions. The book has been very critically gone over and the newer discoveries intimately incorporated so far as they permit of didactic

clinical expression. In this the author has kept the work essentially clinical, and in its neurological sections he has followed the newer work calmly and evidenced good judgment.

We are not impressed with his chapters on the psychogenic disorders here presented. They are, in our opinion, very old fashioned, and are not up to date from the standpoint of modern psychopathology. By this it is not meant they are not Freudian. There has been an enormous movement in psychopathology in the past ten years, of which the Freudian conceptions are but a part; of this the author presents very little, but clings to the general conceptions of some twenty years ago. In these chapters we consider him doctrinaire and obsolete, although the descriptive material is fairly well presented.

The work is well worth while as an excellent neurological manual; the psychiatric aspects are less commendable.

Bram, Israel. GOITER: NONSURGICAL TYPES AND TREATMENT. [The Macmillan Company, New York.]

The wave of enthusiasm for surgical treatment for all forms of goiter is still in its crescendo, and it is high time that more enlightened and honest methods be employed in the treatment of the hyperthyreoses. As the author justly remarks, all other than surgical methods are lightly dismissed by the "*cult of the knife*," our own phrase and justified. "This is an unjust attitude," since for conscientious students of the problem " (1) goiter is preventable, (2) all early goiters are curable, (3) thyroidectomy is a failure in a large percentage of cases operated upon, and (4) a large percentage of goiters surgically treated are perfectly amenable to nonoperative procedures." This is the author's main thesis. We do not quite agree with all of these statements, for (1) some goiters are not preventable; (2) some are malignant from the beginning and only surgery is of any service—and often unavailing; (3) thyroidectomy is serviceable in the malignant types and all other methods yet known unavailing; this statement is all too true.

The author has given us a praiseworthy volume whose main object is to separate the surgical from the nonsurgical types, and as such it is entitled to a universal reading.

It would take a greater genius than the author to clarify the exophthalmic goiter problem, but we are convinced that in spite of many shortcomings his exposition is more entitled to serious study than many of its predecessors.

Vaihinger, H. THE PHILOSOPHY OF THE "AS IF." Translated by C. K. Ogden. [Harcourt, Brace and Company, Inc., New York.]

Another stimulating and fundamental volume of the International Library of Psychology, Philosophy and Scientific Method, this time a translation by the talented editor of the Library himself.

The original German edition has already been reviewed in these pages, and alluded to frequently as one of the most important contributions to modern thinking.

Upon the cover F. C. S. Schiller speaks of this volume thus:

"This impressive work has had a remarkable history. . . . It contains such a wealth of material and of stimulus that no one should henceforth presume to discuss the problems of logic and epistemology without having read and digested it"; and Havelock Ellis: "The problem which Vaihinger set himself out to solve was this: How comes it about that with consciously false ideas we yet reach conclusions that are in harmony with Nature and appeal to us as Truth. . . . Freud regards dreaming as Fiction that helps us to sleep; thinking we may regard as Fiction that helps us to live. Man lives by imagination."

As Dr. Relling in Ibsen's *Wild Duck* states, "Man lives by his illusions." How he is enabled to do so by "theoretical, practical and religious fictions" Vaihinger here most ably shows.

It may be that there is some repetition, at times one is fatigued by the author's dullness, but are not philosophers always a little dull.

In spite of such a minor drawback the volume deserves to be read, as Schiller has stated, by everyone who presumes to discuss problems of logic or of the theory of knowledge. Neuropsychiatrists are constantly presuming to be experts along these lines. Such a work comes as a beacon light where many rush lights have been employed.

It should be noted that Professor Vaihinger's own account of his life work and of the spirit in which this volume has been written has been added by way of a General Introduction.

Lovett, Robert W. *THE TREATMENT OF INFANTILE PARALYSIS.* Second Edition. [P. Blakiston's Son & Co., Philadelphia.]

At the same time that this review was being written we learned of this author's death. Few have done more for honest, conscientious work in orthopedics in America than Lovett, and in this, his last message, we find that same spirit of high purpose and careful scientific method which has given him renown and placed at the disposal of his confreres the rich results of his experience.

Lovett's name will always be meritoriously associated with his superior work in the field of which this monograph treats. This edition, reëdited from the 1917 publication, contains much of his best work. As such it is entitled to a wide reading.

Kammerer, Paul. *THE INHERITANCE OF ACQUIRED CHARACTERISTICS.* Translated by A. Paul Maerker-Branden. [Boni & Liveright, New York.]

If some kind of new capacity has not been transmitted from parent to offspring then evolution could not take place. What the mechanism may be that has brought these new factors into activity may be the subject of lively discussion, but that a gradual ascent by some form of addition has taken place is agreed upon. The general conception of the inheritance of acquired characteristics, chiefly urged by Erasmus Darwin and later more explicitly outlined by Lamarck, has met with much opposition in later years by a preponderant number of biological students, but in spite of the pendulum's swing to this pole of belief a strong tendency to an opposing position has been

manifested, of which this work is evidence, and the author's experimental activities a reasonable justification.

This is no place to critically discuss the *pros* and *cons*; such are more reasonably to be fought out in media devoted to biological problems, but for the neuropsychiatrist whose interests in these problems are in a sense secondary we can only say that Kammerer has given us an extremely interesting presentation, and one whose reading is well worth while. Whether his arguments and the deductions drawn from his experiments prove his contentions or not, we are not in a position to state. In fact, we are indifferent to the niceties of dialectic controversy. We have lived through many cycles of yes and no, and believe that truth is always relative and never final. We therefore welcome this volume and commend it most heartily to our readers.

From our many century old experience, historically speaking, that majorities are usually arbitrary and absolutistic, we harbor the suspicion that they are never quite correct. Upon this general platform, and upon a certain affective affiliation with the functional aspects of biological happenings, we incline to general Lamarckian tendencies, and hence are inclined to believe that Kammerer has much to say of value to our particular aspect of science.

Kafka, V. SEROLOGISCHE METHODEN, ERGEBNISSE UND PROBLEME DER PSYCHIATRIE. [Franz Deuticke, Leipzig und Wien, 1924. Mk. 8.50.]

The publishing of the various outlined chapters of Aschaffenburg's *Handbuch der Psychiatrie* were seriously interfered with by the war, and only now the projected program has been again taken up, as evidenced in this and other recent contributions to this important enterprise.

Kafka's serological volume comes from one whose position in Weygandt's Clinic in Hamburg offers unrivalled opportunities. The rich clinical material not only of Friedrichsberg but Nonne's Eppendorf service has been utilized to the full in the preparation of this unrivalled monograph. There are but 200 pages but the entire field of serology is most adequately and comprehensively covered. In its particular field it will remain a classic for some time to come.

Rümke, H. C. ZUR PHANOMENOLOGIE UND KLINIK DES GLÜCK-GEFÜHLS. [Julius Springer, Berlin.]

To the ordinarily alert observer of mankind one phenomenon stands out as most astonishing, if not amusing. Turn where he will, such an observer finds almost all mankind a believer in "luck."

Until we opened this work we had little idea of the many treatises which dealt with this singular "wish-fulfilling phantasy" of mankind—and on looking over the list, are astounded to see how far these many tomes have really been from getting at grips with the situation.

Lotteries, horse racing, stock market operations, religious fanatics, mystics, paretics, schizophrenics, hysterics, manics, these expressions of major and a thousand minor situations, show how widespread is

the wish of getting "something for nothing," and how multifarious are the schemes to "work the public" or to delude the self on the basis of this infantile aspect of human nature.

We do not feel that the author has seen this problem in its widest aspect—he has hardly done more than group the phenomena, he does not give a deeper explanation—but notwithstanding this he has shown that the fundamental residue which permits the phenomena is one of psychopathology. The most obvious pathological situations which show the belief in "luck" are psychotic. The "schizophrenic"—*i.e.*, in Freud's terminology, the "narcissistic neurotic" is an exquisite example of the belief that "he" should be the recipient of all good fortune.

This does not mean by any means that the gambler, large and small, is a "dementia precox patient," but it does signify that with that degree with which one identifies himself with being one favored of the gods, *i.e.*, God-like, and hence "lucky," he is pathological. The "perverse" gambler is simply one who recognizes there are "suckers" in the world, and he is one whose spiritual development is so stultified that he is going to profit by the fact that this universal fantasy can be worked, and "he" is going to "shear the lambs."

These are but sidelights of the problems dealt with in this really very interesting monograph. The author follows a more restricted line of discussion: Lucky experiences of the psychasthenic, of the Epileptic in the Aura (hunches many people call them), in the intoxicated, in psychopaths, and in so-called normals, *i.e.*, hypothetically average individuals.

A third chapter would analyze the "Lucky Experience." This is done under several heads: (1) Autochthonous Lucky Feelings as portions of a psychotic syndrome; (2) Religious Lucky Feelings; (3) The Sublime Emotional State of the Obsessional; (4) Lucky Feelings in Psychopaths (most gamblers) and "Normals."

In this interesting study one feature of value is missing, *i.e.*, the lack of the author's acquaintance with the Freudian mechanisms, particularly those of "projection" and "identification." Had he been acquainted with this illuminating aspect of psychopathology we would have had a much wanted classic in this field.

Kyrle, J. UEBER DEN DERZEITIGEN STAND DER LEHRE VON DER PATHOLOGIE UND THERAPIE DER SYPHILIS. Dritte Auflage. [Franz Deuticke, Leipzig und Wien, 1924. Mk. 2.50.]

For a reasonable and reasoned summary of the present day knowledge of the pathology and therapy of syphilis this small brochure offers an orientation that is well worth while.

The neuropsychiatrist meets with the syphilitic problem at every turn in his practice. We can commend this small but well rounded volume.

Freud, Sigm. BEYOND THE PLEASURE PRINCIPLE. [Bonj & Liveright, New York.]

In this book Freud first summarizes the pleasure principle and its

relation to the reality principle. Pleasure, he assumes, results from a relaxation or discharge of painful tension. It is an effort of the organism to approach a state of equilibrium from which the influence of *reality* has diverted it. Roughly, pleasure or pain may depend upon the quantity of excitation present in a part of the organism; and probably the decisive factor for one or the other type of feeling is the diminution or increase of excitation in a given time. The pleasure principle is therefore related to a tendency to keep the amount of excitation as low as possible, or at least constant. This tendency is then one toward stability.

Since most of our psychic processes are not accompanied by or even conduce pleasure, we are forced to see in the instinct of the ego to preserve itself the replacement of the pleasure principle by the reality principle. However, the pleasure principle is merely deferred; immediate satisfactions are delayed with the object of finally reaching through a longer and more circuitous route pleasure that shall not lead to destruction. In the case of the sex instincts the pleasure principle may prevail over the reality principle to the detriment of the whole organism.

But pain or distress or discomfort also proceed from psychic conflicts and dissociations, as well as from the substitution of reality for pleasure. Inborn instincts develop unevenly and may prove irreconcilable in the effort for psychic unity. Those that are not thus assimilable are repressed and cut off from gratification. Living independently at a lower psychic level, these repressed, nonassimilable instincts may fight their way by circuitous routes to a substitutive expression; and this is not felt as pleasure but as pain. The details of the process by which this takes place are not yet fully understood. Pain in this case is the reaction to a pleasure which cannot be experienced as such and is neurotic in character. Most of the pain or discomfort that we experience, however, is of a perceptual order, and results from either the urge of unsatisfied instinct or the apprehension of something dangerous in the external world.

In the traumatic neuroses there are two outstanding features: one is that the chief causal factor seems to lie in the element of surprise, in fright; the other is that a wound sustained at the time of this surprise tends to prevent the occurrence of a neurosis. Apprehension denotes the expectation of danger and an unconscious preparation; fear is presented with a definite object; but fright is produced by an unexpected danger. A traumatic neurosis is a fright neurosis. In the dreams of these shock-neuroses the patient is taken to the situation of his disaster and he repeats it. This is contrary to the wish-fulfilling tendency of dreams in general.

The study of an otherwise exemplary child of eighteen months, nurtured and cared for exclusively by its mother, that when left alone threw its toys and other objects in a corner or under the bed with an expression which was found to mean "go," brought out the ideas that he was either making himself master of an unpleasant experience which he suffered passively or that he was having revenge upon his mother (for leaving him thus alone for several hours) by himself

symbolically sending her away. Probably both motives were at work. But there may be an element in this case which is beyond the pleasure principle, that is, earlier, and that may be a more fundamental tendency. That is the tendency to repeat.

Freud says that five and twenty years have wrought a change in the aims of psychoanalytic technique. At first unconscious purposes were unraveled and synthetized and then at the proper moment revealed to the patient. Later development in the technique stressed the resistances of the patient. The object then lay in making the patient aware of these and by sympathetic influence teaching him to abandon them. Finally it became clear that these methods were insufficient for completely bringing the unconscious into consciousness. It is impossible for the patient to recall all that lies repressed and perhaps not even the most important part of it. Therefore he gains no conviction of the real power of these repressions. Consequently he is obliged to repeat with the physician the tenor of his repressed impulses. The physician becomes father or mother or fate or other object of the repressed desires, as well as the person with whom his conscious ego has to deal. With the physician he lives through painfully a fragment of his forgotten life. The more of this that the physician can bring into conscious memory the better. But maintaining sympathetic supremacy, the doctor must see to it that the patient is really convinced of the force of these early nonassimilable impulses in the production of his neurosis. Cure depends upon conviction.

The unconscious impulses wish to get out. Therefore the resistances, although unknown to the patient, are not part of the unconscious, repressed material. To escape ambiguity Freud here drops the descriptive terms unconscious and conscious, and speaks of the repressed ego and the coherent ego. The resistance comes from the coherent ego, while the repetition-compulsion arises from the repressed ego. The resistance of the conscious and preconscious ego subserve the pleasure principle because the repetition of the trends of or the disclosures of the repressed ego bring discomfort to the coherent ego. Thus the gratification that the submerged ego derives from its efforts to have its way, to experience its desires, is felt by the coherent ego as discomfort or pain. But in this repetition-compulsion, extraordinarily enough, there are elements which never could have brought pleasure or satisfaction. The child can from his early sex desires only meet disappointment. This failure accompanied by distress leaves a narcissistic scar, from which arises the "inferiority complex"—"I never can do anything." Freud then discusses the people who unconsciously always bring a repeated fate upon themselves, and concludes that there exists in psychic life a repetition-compulsion which goes beyond the pleasure principle and to which he ascribes the dreams of psychically shocked patients and the play impulse in children. But this repetition-compulsion can rarely be seen unmixed with other impulses. It seems, however, to be more primitive and elementary than the pleasure principle.

Freud starts his fourth chapter by saying: "What follows now is speculation, speculation often far-fetched, which each will according

to his particular attitude acknowledge or neglect. Or one may call it the exploitation of an idea out of curiosity to see whither it will lead."

The perceptual conscious system placed in the cortex receives excitations from without and feelings of pleasure and pain from within. Consciousness is the only function of this system and leaves no permanent traces within it as in the case of the systems which it embraces where memory records are engraved. Memory is not part of this system. Consciousness takes the place of these memory traces. If lasting memory records remained in this system there soon would be limited its fitness for the registration of new excitations. Its peculiarity then is that the excitations do not leave any permanent alteration of its elements. The explanation of this seems particularly "far-fetched." We are asked to imagine an undifferentiated vesicle of living substance the outer surface of which receives the stimuli from the surrounding world. Embryology repeats evolution and the gray cortex (the nervous system arising from the ectoderm), a derivative of the superficial layer, may have inherited essential properties from the rind of this vesicle. That has been so burnt through by stimulation that it is incapable of further modification. Consciousness takes the place of the alterations produced in memory records because the outer layer, modified to the utmost by former stimulation, presents a lowered resistance to the excitations from within and without. There is no "bound" energy here. At this point the description is very obscure, for the outer layer of the vesicle is spoken of as a protective barrier against the multitudinous stimuli that would otherwise destroy the layers below. The function of the outer layer is to collect information about the nature and direction of the external stimuli. The special senses become sort of antennae and also mitigate the stimuli. There is a protection from without then, but none from within. Hence large masses of stimuli of internal origin cannot be "bound" in the conscious system and it therefore treats them as though they came from without. This is a defensive measure and gives rise to the mechanism of projection.

The traumatic neuroses may be the result of a rupture of the barrier against external stimuli. By the failure of apprehension to gather a counter charge of energy to meet the oncoming stimulus mass, the latter is not "bound." There is a surprise attack. This has to be bound afterwards. The dreams that follow, like battle dreams, are not wish fulfillments but are in the interest of psychic binding. The anxiety is developed after the shock. There is a psychic effort to master the situation. Hence the repetition-compulsion. Wounds relieve the situation by a narcissistic binding of the libido.

The repetition-compulsion shows an instinctive demonic character. Freud sees in instinct, which he points out is not understood, an innate tendency in living organic matter impelling it toward a re-statement of an earlier condition that external forces have obliged it to abandon. If instincts are therefore conservative or even regressive in tendency, development must be due to external disturbing influences; but the instincts finally absorb these alterations, storing them for repetition. The goal of the organic is to become again inorganic;

the goal of life is death. But to reach the goal of death, life is obliged to travel over the road by which it developed and it must refuse to make short cuts. The reproductive cells, which have separated themselves from the rest of the organism, are charged with inherited and newly acquired instinctive dispositions and repeat the cycle to which they owe their origin. They seem potentially immortal, but it is possible that they are only lengthening the path to death. However, the instincts which care for them are the sex or life instincts and these run counter to the death instincts.

It is then the ego instincts which tend toward death and the sex instincts which tend toward the preservation of life. But the self-preservation instinct, extending the libido theory, is the resultant of the sum of libido quantities that bring about adherence of the somatic cells and is a narcissistic libido. Freud's idea of the libido now corresponds to the Eros of the ancient writers. He denies that there are no other instincts than libidinous ones, but finds this difficult to prove. In the sadistic tendency he thinks we have a death instinct projected. In masochism there is a recoil of the sadistic impulse onto the self. But, contrary to his former views, he thinks masochism may be primary. There is a tendency in the manifestation of life, which is accompanied by chemical tension, to seek equilibrium, which is death. But the union of one germ cell with another increases those chemical tensions. The ruling tendency of psychic, perhaps nerve life, is the struggle for reduction or removal of inner stimulus tension—as seen in the pleasure principle. Freud sees here one of the strongest motives for crediting the existence of death instincts.

The origin of sex propagation is difficult to determine, but it may be the outcome of, as well as a part of the phenomenon of growth. Life instincts must have been present in the beginning of things as well as the death instincts. Possibly living substance was at one time rent into small particles which strive for reunion by means of sex instincts. They are thus trying to reestablish a former state, and even the life instinct, sex instinct, is therefore brought within the repetition-compulsion.

As may be seen, this little book is pregnant with thought. It makes an excursion into philosophy. Freud, toward the end of it, says that he does not know how far he believes in the views here set forth. But he also says that he cannot deny that some of the analogies, relations, and connections herein traced appear to him worthy of consideration. One wishes that some of the views were supported by more evidence and that the obscure and puzzling speculation might be capable of greater explicit phrasing. [HORACE CARNCROSS, Philadelphia.]

OBITUARY

ADOLF VON STRÜMPELL

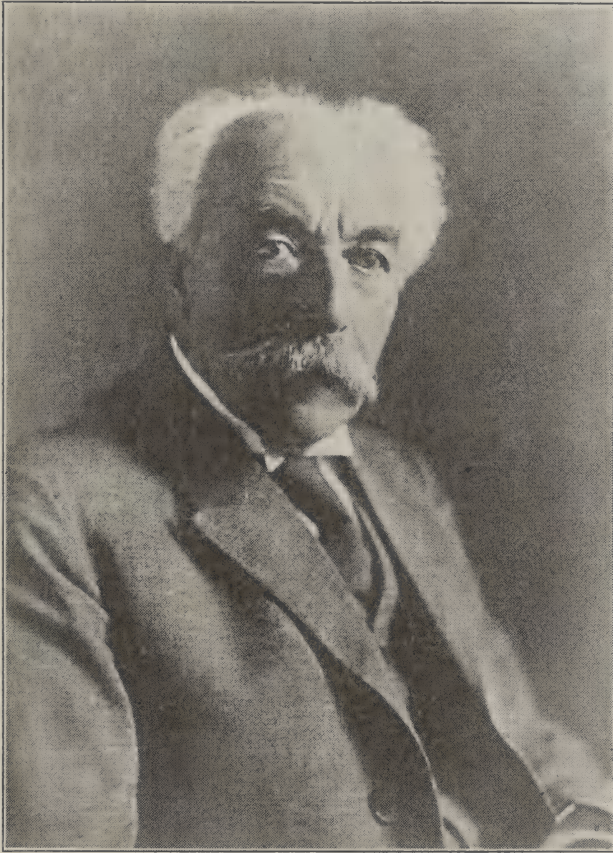
Adolf von Strümpell, whose death occurred in Leipzig, January 10, 1925, leaves behind him the influence of a richly endowed personality. It was of the nature of such a personality that Professor von Strümpell should give generously in social contacts, in the things of culture, and chiefly in warm, sympathetic devotion to the patients whom he served, the students he guided, the colleagues with whom he had contact. In consultations and medical congresses outside his own land he represented the best of his nation and his profession.

He was born in 1853 of German parents but in what was then a Russian province. His education was obtained in Germany and Austria, with especial clinical advantages in Leipzig. From student days, his interest turned chiefly to neurology, although his researches and publications greatly enriched other fields of medicine. His textbook of internal medicine has seen no fewer than twenty-five editions.

The frequent association of his name with neurological terminology indicates the extent and importance of his work in this territory. From his entrance into Leipzig he was associated with such men as Wunderlich, Wagner, Weigert, Cohnheim, and Erb. He himself carried on the Polyclinic in Leipzig for thirty years and served also in the same capacity in Erlangen and Breslau. For a short time he conducted a clinic in Vienna.

His earliest work in neurology was upon the sense of touch, a study of his student days. The later years found him pursuing his neurological research in all directions. With Erb he worked out many diseases of the brain and spinal cord. He performed distinguished work in the field of syphilitic and other spastic spinal paralyses; upon combined sclerosis and in pseudosclerosis, which bears his name and that of Westphal. Polioencephalitis of children received illuminating investigation from him. So also did the traumatic neuroses, which he was one of the first to stamp as wish neuroses. The toxic origin of many nervous diseases was discovered by him. He it was who laid emphasis upon "metasyphilis."

Professor von Strümpell was a man of fine, genial nature, a thorough student of a new problem but not an implacable combatant for the facts he had set forth. He could afford to wait; he himself grasped at no hypothesis or new method in unconsidered haste, but approached all opportunities for progress with a spirit of investiga-



ADOLF VON STRÜMPELL


tion thorough and profound. He was particularly fitted by his nature for the comprehension and help of his patients in their psychical difficulties.

His recent *Lebenserinnerungen eines deutschen Klinikers* is a valuable account of his early fruitful associations in Leipzig and of the work carried on there at that time. [Jelliffe.]

JOHN JAMES GRAHAM BROWN

The death of John James Graham Brown means the loss of an outstanding personality in the Edinburgh traditions of medicine. Dr. Brown brought to his private as well as his professional activities an energetic and stimulating liveliness of interest which was combined with deep studiousness. The son of the Reverend Thomas Brown, D.D., he arose from an ancestry of culture on both sides, including a number of representatives of the medical profession. His sympathies were extended not only through his wide reading but through rich intercourse with many men at home and in his frequent travels upon the Continent. Social and political problems commanded his attention and he revealed talent in the fields of art and literature.

Dr. Brown began his school life at the Edinburgh Academy and was graduated from the university in 1875. After a period of hospital service he studied at Paris, Berlin, Vienna, and Prague. His degree in medicine was taken in Edinburgh in 1878. His long years of practice in that city were marked by various distinguished services. He was elected Fellow of the Royal College of Physicians in 1882; was sent upon a commission to Spain in 1885 to investigate an epidemic of cholera. He was appointed Assistant Physician to the Royal Infirmary in 1897, where he was also Acting Physician from 1912 to 1919. He was instructor and examiner in general medicine and Morison lecturer to the college from 1912 to 1919. He lectured to the university upon neurology, his interest in which subject has been perpetuated in his *Treatment of Nervous Diseases* (1905). He was president of the Royal College of Physicians in 1912. He published as early as 1882 *Medical Diagnosis: A Manual of Clinical Medicine*, and was the author of other medical contributions as well as several novels. In all his writings, teaching, and practice he revealed a mind naturally selective of the essential in material and able to determine the relative value of facts and hypotheses. [Jelliffe.]



N. B.—All business communications should be made to Journal of Nervous and Mental Disease, 64 West 56th St., New York.

All editorial communications should be made to Dr. Smith Ely Jelliffe, Managing Editor, 64 West 56th St., New York.

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ORIGINAL ARTICLES

BISMUTH TREATMENT OF CEREBROSPINAL SYPHILIS *

BY W. A. SMITH, M.D.

AND

L. J. FOSTER, M.D.

ANN ARBOR, MICHIGAN

The treatment of neurosyphilis with bismuth is attracting considerable attention, and its use has been recommended, especially by French and German investigators. We began to treat all forms of neurosyphilis with bismuth eighteen months ago and have reported our results in tabes and paresis (1). We now wish to report its effect on twenty-seven unselected cases of cerebrospinal syphilis other than paresis and tabes dorsalis.

While this series does not embrace a large number of cases, we have had the opportunity to compare them with groups of similar cases treated with mercury succinimide or sulpharsphenamine in this clinic, and also with those treated with arsphenamine or tryparsamide in the clinic of dermatology in this hospital.

We have used a preparation of metallic bismuth suspended in oil such that each cubic centimeter contains ten centigrams of bismuth. The dosage given was two cubic centimeters. Injections were made deep into the buttocks two or three times weekly. A series of twelve injections was given, followed by a rest period of two months. Most of our cases were given a total of twenty-four injections. Milian (2) recommends a total of sixty injections and states that twenty-four should be the minimum.

* From the Department of Neurology, University of Michigan Hospital, Ann Arbor, Michigan.

REACTIONS

Investigations of late tend to show that bismuth does not pass into the spinal fluid, in either the normal, or in those with central nervous system syphilis (3) (4). However, we believe that this fact is of minor importance. The mode of the action of bismuth is somewhat uncertain. Some believe it is directly trypanocidal and others believe its action depends upon inducing a phagocytosis, while Citron (5) is of the opinion that it activates a specific tissue substance, which is trypanocidal. The bismuth in the doses given was relatively nontoxic. There was no case of a generalized reaction of any kind. No cases developed diarrhea or other gastrointestinal disorder. In comparison with arsenic, Gougerot (6) states that bismuth is much less toxic on the viscera.

It seems devoid of danger in affections of the optic nerve. One of our cases with advanced optic atrophy showed marked improvement in vision, a result which we have not observed in cases treated with other drugs. Some writers advise caution in the use of bismuth where there is evidence of nephritis. No patient developed albuminuria during treatment. In only two of our cases was albuminuria present before treatment. In one of these, the albuminuria disappeared shortly after the conclusion of treatment. In the other, the albuminuria before treatment was accompanied by large numbers of granular casts in the urine, a blood pressure of 165/85 and edema of the ankles. We administered bismuth cautiously to the patient without clinical signs of aggravation, and two months following the conclusion of treatment there was but a slight trace of albuminuria, only an occasional cast, and no edema of the ankles, although the patient had carried on strenuous work during the rest period; the blood pressure fell to 145/75. Lortat-Jacob (7) stated that bismuth is indicated in luetic nephritis accompanied by edema and chloride retention, and also in chronic nephritis occurring in luetics. Tzanck (8) states that bismuth is the least irritating to the kidneys of the antiluetics, and he believes that a nephritis during treatment is due to the lues or a preceding stomatitis. This agrees with the opinion of Emery and Morin (9).

A slight bismuth line about the teeth appeared in three cases, but treatment was continued regardless of this and in all it gradually disappeared following the conclusion of treatment. In two cases, eroded areas appeared on the buccal mucosa, and these also gradually subsided. In all cases, rigid oral hygiene was considered a part of the treatment. The paucity of reactions agrees favorably with the reports of others.

ANALYSIS OF CASES

Six cases were chiefly of the spinal type, and all complained of stiffness of the legs. Other symptoms were numbness, pains, slight urinary retention in two, and urinary incontinence in one. On examination they all showed Argyll-Robertson pupils, increased tendon reflexes, Babinski's reflex, tremor, impaired deep sensibility and a spastic or spastic ataxic gait. Nystagmus was present in one case, optic neuritis in two. The duration of symptoms before treatment varied from four months to three years, except one whose symptoms had been present for nineteen years. There had been no previous treatment, except thirty intramuscular injections of mercury in one and eighteen intravenous salvarsan treatments in another. A case of advanced Erb's spastic paraplegia syphilitica was not improved in any way after twelve injections. Although six months pregnant at the institution of treatment, she passed through a normal delivery. The child presented no stigmata of hereditary lues but had a four plus Wassermann reaction on the blood. In the other cases, pain, numbness and urinary disturbances were entirely relieved. The gait was markedly improved in four, one of which had been bed-fast for four months, and this patient was able to walk without the aid of a cane after treatment. The neurological examination was essentially unchanged in all. The blood Wassermann reaction remained four plus in four, and changed from negative to four plus in the other two. The spinal fluid Wassermann reaction was unaffected, but there was some reduction of cellular and albumin content, and some change in the gold curve in all of this group.

Five other cases were also chiefly of the spinal type, but there was no spasticity, and the chief symptoms were sharp pains and numbness; there was urinary retention in two. The duration of complaints had been from nine months to six years. In one case the pupils were normal, in all others, they were of the Argyll-Robertson type. The reflexes were increased in three, normal in one, while the knee and Achilles were lost in two. Deep sense was impaired in the lower extremities in three, and a marked tremor of the hands was present in three. In all cases, pain in the legs disappeared and in one case, abdominal pain also was relieved. Complete urinary retention in one case, which had been present for three years, disappeared after six injections. In the other, difficulty in urination disappeared. The clinical examination remained the same in all. The blood Wassermann reaction was four plus in all, both before and after treatment. The spinal fluid Wassermann reaction changed from four plus to three plus in one, and in the others remained four

plus. The cellular and albumin content of the spinal fluid was somewhat diminished in all cases.

Two cases were of the vascular type, a history characteristic of cerebral thrombosis, and both had a residual right hemiplegia with pupils which reacted sluggishly to light. One had had the hemiplegia for six months, and except for slight improvement in the use of the right arm and leg, he was not benefited by treatment. The other had been stricken one month and had already improved markedly before treatment, but complained of dizziness. After treatment he no longer complained of dizziness and the disability in the right side continued to improve. At the end of treatment, the examination in these two cases was unchanged except for improvement in walking, and in the use of the affected arm. The blood Wassermann reaction which was four plus in both was unaltered. The spinal fluid remained essentially unchanged.

Another case was one of acute luetic meningitis. He had had severe headache, dizziness, and persistent vomiting for five weeks. The symptoms appeared six weeks following six intravenous injections of salvarsan and twelve weeks following the primary sore. Examination showed a bilateral sixth nerve weakness, neuroretinitis, and increased knee and Achilles jerks. After six injections, his dizziness and vomiting disappeared. After twelve injections, he suffered no longer from the headache. The neurological examination became negative, and has remained so for eleven months. The Wassermann reaction on the blood and spinal fluid was four plus; the blood Wassermann reaction changed to plus-minus, while the spinal fluid Wassermann reaction remained four plus. The cell count on the spinal fluid was reduced from 150 to 38, with a corresponding decrease in the globulin content, and a change in the gold curve.

Six cases were mainly of the cerebral type, complaining of headache, dizziness, vomiting and poor vision. There was incontinence of urine in one. There had been no previous specific treatment in any, and the duration of symptoms had been from three weeks to fifteen years. Examination showed the pupils sluggish or fixed to light, a neuroretinitis, and cranial nerve palsies in some cases including the third, sixth or seventh cranial nerves. In all cases, the subjective complaints were greatly relieved, in two cases so much so, that they could not be induced to complete their course of treatment. The cranial nerve palsies were not affected, except that the drooping of the lower eyelids in one case with facial palsy, returned to normal. The objective findings in all of these were not altered by treatment. The blood Wassermann reaction was four plus before

and after treatment in all cases. The spinal fluid showed no important changes after treatment.

In the next group of five cases, the symptoms were of hysteroidal type. They all had a positive blood Wassermann reaction. The symptoms varied greatly, such as feeling of oppression in the epigastrium, palpitation of the heart, paresthesias, anxiety attacks, severe spells of weakness, trembling and sweating, weeping spells and vague pains. The complaints were of from six weeks to ten years standing. The neurological examination in all showed no signs of organic disease of the nervous system.

One case had had ample previous antiluetic treatment. All cases were completely relieved of symptoms, except one who still complained of paresthesias. In one case the blood Wassermann reaction became negative, and in another plus-minus. In the others, it remained four plus.

Two cases were of Parkinson syndrome, with pupils fixed to light in one, and sluggish in the other. They had a positive blood Wassermann reaction, and a negative spinal fluid Wassermann reaction. In one, there was no improvement in symptoms or objective findings. In the other, the tremor was markedly diminished. Examination was otherwise the same after treatment as before.

CONCLUSIONS

Pains, numbness, paresthesias, dizziness, headaches and urinary disorders were relieved in cases of cerebrospinal syphilis.

A case of luetic meningitis showed rapid recovery with no return of symptoms of nervous system involvement eleven months later.

One case of spastic paraplegia was unchanged; in the other cases, spasticity was greatly diminished, which was especially manifest in the gait.

Five cases presenting hysteroidal symptoms with no signs of organic disease of the central nervous system but with a positive blood Wassermann reaction, obtained marked relief from symptoms.

In two cases of paralysis agitans with positive blood Wassermann reaction, and pupils which were sluggish to light, the tremor was improved in one, and unchanged in the other.

The use of bismuth did not reduce the Wassermann reaction of either the blood or spinal fluid in cases of syphilis of the nervous system. We believe, however, that this is not a necessary objective, and that treatment should be guided by the clinical symptoms and not directed toward a negative serology. The objective signs of syphilis of the nervous system were also not materially affected. We believe

bismuth is of value in treatment of cerebrospinal syphilis. It is especially effective for subjective symptoms.

Two cases of multiple sclerosis were treated with bismuth without relief.

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THE ASYMMETRY OF THE HEMISPHERES OF THE BRAIN IN MAN AND ANIMALS

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IN PETERSBURG

- A. 1. Introduction.
- B. 2. The asymmetry of hemispheres of the brain in man and animals.
 - 3. Anatomical and functional asymmetry.
 - 4. The course of the development of functional inequality of hemispheres.
 - 5. The asymmetry of hemisphere from the point of view of evolution of the nervous system.
 - 6. Facts from onto- and phylogenesis.
 - 7. The cause of inception of asymmetry.
- C. 8. The mechanism of development of asymmetry of hemisphere.
 - 9. Causes of righthandedness.
 - 10. The results of righthandedness.
 - 11. Development of the asymmetry of mature speech.
 - 12. The asymmetric development of gnosre functions.
- D. 13. Agents forming the organization of the brain.
- E. 14. The future of asymmetry.

INTRODUCTION

Many clinical and experimental facts disclose, that the progressively developing and symmetrically arranged nervous system of vertebrates has entered in man into a new phase of its development, characterized by an unlike *asymmetric* development of the large hemispheres of his brain. The nature of this development consists in that a series of functions as speech, writing, reading, customary and expressive actions, the visual and auditory gnosis, and some others are perfectly developed in man only in one *predominant* hemisphere. Clinically this functional difference of hemispheres expresses itself in that a lingering or entire loss of the said functions has been observed at destruction of determined sections of the cortex only in this predominant hemisphere, while the centers in the subordinate hemisphere provoked, as a rule, no infractions of these functions or but temporary and insignificant. These facts, long ago clinically established, have been lately again confirmed on an extensive war material by Förster and Kleist.

THE ASYMMETRY OF HEMISPHERES IN MAN AND ANIMALS

The asymmetry of the hemispheres of a man's brain is a phenomenon the more so remarkable that until now we had no sufficiently

convincing and evident signs of its existence in any other representatives of the numerous class of vertebrates, even in the highest representations of mammals. In dogs, monkeys and also in speaking parrots (Kälischer) both hemispheres are quite symmetrically organized. Evidently this virtue of the large hemispheres of the brain is confined to the representatives of the *homo* kind.

However, it would be wrong to suppose that in man only the highest *human* functions are asymmetrically developed: Speech, writing, reading and the like; such functions in him are also asymmetrically developed as the visual and auditory gnosis in the broad sense of the word (*i.e.*, the comprehension of that seen and heard) equally peculiar in animals, but developed in them symmetrically.

All the asymmetric functions (and the functions of the cortex in general) can be divided into two categories—the gnostic and the praxic. Among the many distinctions between both categories their following virtues are the most important for the ideas developed in this investigation: The gnostic functions constitute the basis of the praxic ones—“praxis without gnosis is impossible” (Edinger); praxic functions are means of *objectifying* cerebral processes, chiefly of the sensory, that is the *working* organs of the cortex; as in *energetic* respect it is important to note that the working organs are particularly or even exclusively developed in one hemisphere; most of the gnostic functions, especially the visual and auditory, are constructed on the basis of the material brought through the symmetrically disposed absorbing organs—the eyes, ears, the olfactory epithelium, etc.—*similarly* into both hemispheres. As regards the virtues *general* to the functions of both categories, it should be mentioned that all the asymmetric functions are, as a rule, concentrated in the same *one* hemisphere.

ANATOMICAL AND FUNCTIONAL ASYMMETRY

That the functional improvement of an organ has in its foundation a complication and a perfectionment of its anatomical organization is a well-established fact, confirmed by all the evolution of the organized forms; therefore in man it was *a priori* necessary to expect a distinction of the anatomical organization of the large hemispheres of the brain. And, indeed, many investigators of this side of the matter have discovered different kinds of facts showing that in the foundation of the functional inequality of the hemispheres anatomical asymmetry also lays.

Thus the left Sylvian fossa is 3 mm. longer than is the right (Weinberg) and the left hind ventricle is larger than the right (Förtis). Flechsig has anatomically shown that in the right handed the nervous fibers in the posterior portions of the corpus callosum particularly go from right to left, and in the front section from left to right. It was also observed that the sinuosity of the predominant hemisphere is developed better (Ogle, Cunningham), are more numerous (Broadbent), and organized more perfectly (Henschen); there being also information that the left cortical center of the right hand (of the right handed) occupies a larger space than that of the left (Allen Starr, Exner).

For all the supporters of the biological principle—"functions are from beginning to end the determining causes of structure" (Spencer)—the presence of an anatomical basis of the asymmetry of hemispheres cannot appear as an unexpectedness. It must be observed, however, that the degree of anatomical asymmetry is far from corresponding with that which should be expected on the basis of the functional distinction of hemispheres, as it expresses itself considerably weaker. The reason is probable that the foundations of morphological asymmetry of hemisphere lie not so much in the gross anatomical alterations but in differences in number and degree of development of sinuosities, in more fine, hardly determinable histological peculiarities of organization, and degree of development of the nervous centers, and chiefly in their connections. Besides this, we still know little of the degree and nature of the participation of the right hemisphere in the realization of asymmetric function so as to make exhaustive conclusions in respect to this side of the question.

THE INNATENESS AND HEREDITABILITY OF ASYMMETRY

Many facts relating to the asymmetry of hemispheres may be satisfactorily explained only on condition of accepting it as an *innate state*, so, for instance, righthandedness is disclosed in such an age (seven-eight months) when there can be no talk about any choice whatever or acknowledging imitation. It would be wrong to suppose that functions are innate; only the organization of the anatomical substratum, realizing these functions, is innate. The latter must be understood so that in the predominant hemisphere the cellular complexities and the courses connecting them are already at birth better or more prepared for the performance of corresponding functions. This *à priori* supposition is supported in Flechsig's and Gratiolet's investigations. The former has discovered that the left

visual tract myelinated before the right one, and the latter that the left hemisphere generally develops before the right one.

But the asymmetry of hemispheres is not only an innate state. Repeating itself from generation to generation, it changed in respect to some of the asymmetric functions, phylogenetically more older, into a constitutionable state, strengthened by inheritance. Hereditability doubtless in respect to functional unidexterity, is proved by the investigations of the genealogy of the lefthandedness. However, Hier's assertion that at present "lefthanded results from the lefthanded (respectively, righthanded from the righthanded) is certainly too wide and does not answer the true state of matters.

For normal conditions the externally determinable symptom of the asymmetry of hemispheres is the hand. By the predominant hand we judge of the ruling hemispheres. In pathological cases we may judge of the ruling hemisphere by the derangement of the asymmetrical functions.

THE CAUSE OF THE DEVELOPMENT OF FUNCTIONAL INEQUALITY OF HEMISPHERES

The explanation of the causes of the inception of asymmetry of hemispheres is not of an exclusively theoretical interest as an explanation of a determined biological phenomenon; it may obtain also a great practical importance.

For the general course of development of humanity the right solution of this question may evidently obtain considerable importance.

The oldest, *i.e.*, the "arterial" theory (Ogle, Lueddeckens), which attributed the development of left hemisphericity to the blood supply of the left hemisphere, owing to a larger left carotid and a stronger pressure in it, excites much doubt.

Admitting even the existence of such a difference between both arteries (it being, however, contested by many investigators), we nevertheless in no way positively say that the more energetic blood supply of the left hemisphere is the cause and not the result of a functional predominance of the left hemisphere. Physiology gives more examples of a contrary dependence where a more energetic function of the organ leads to its increased blood supply. An increased function of the brain, the ventricle and of the extremities is accompanied by a higher blood affluence, and these are not the most convincing examples of this kind. Pey Smith, Cunningham, and Jones have made other serious objections against the "arterial" theory. In particular, the increased frequency of embolism and

hemorrhages in the left hemisphere, in which its followers have seen a support to their point of view, could not be confirmed by Jones in his extensive material comprising 639 cases of embolism and 376 cases of hemorrhage.

Gould's theory also about best sight with the right eye, as the first cause of the asymmetry of hemispheres, is built on such an unsteady ground, and meets with so many contradictions with the many facts cited below about the degree and successiveness of the development of separate asymmetrical functions, that it cannot be seriously deliberated.

As regards Weber's point of view about the inception of asymmetry of hemispheres depending upon righthand writing, it partially coincides with the theory developed in the given investigation. But Weber was wrong in affirming that writing is the only agent which created the asymmetry of hemispheres. Besides that, he confines himself to the indication of a purely dependence of writing and the development of the predomination of one of the hemispheres; in this respect he is only repeating the idea expressed by others long ago before him (Erlenmeyer, Bichat, Broca, and others), and according to which the cause of the asymmetry of hemispheres is righthandedness in general. At the same time none of the enumerated theories explain the many increments of the inception and degree of unilateralness of separate asymmetric functions, some of them being in total contradiction to the facts.

THE ASYMMETRY OF HEMISPHERES FROM THE POINT OF VIEW OF EVOLUTION OF THE NERVOUS SYSTEM

In "The Origin of Man" it was proved that in the development of his physical organization he is subject to the same laws as all the animal world. In explaining the mechanism and the causes of its peculiarities we must, therefore, follow the regular courses of development of the animal organism.

Examined from a general point of view, the asymmetry of hemispheres is a definite stage of evolution of the large hemispheres of the brain of vertebrates. It would evidently be imprudent to undertake the investigation of the causes of its inception and of the mechanism of its development otherwise than by a naturally scientific method, *i.e.*, explaining the genesis of asymmetry and in basing ourselves on the regular course and on the agents of development of the nervous system.

FACTS FROM ONTO- AND PHYLOGENESIS

The study of the onto- and phylogenation of asymmetry of hemispheres has disclosed a series of essentially important facts.

Originally the asymmetrical functions ended more or less *bilaterally* and their displacement into one hemisphere is accomplished with age. It was also possible to establish, without committing a grave mistake, that in civilized people the asymmetry of hemispheres is more sharply expressed than in the uncivilized, and in men (right-handedness, for instance) sharper than in women. These exist observations and facts, collected by celebrated and scrupulous scientists, respecting the existence of the asymmetry of hemispheres in the unlettered and in children prior to their learning to write. Russia, where general education is still yet a distant utopia, furnishes in the first respect a rich material. The facts discovered prove that the asymmetry of hemispheres is in a considerable degree a state obtained during individual life, and also that in civilized people, in man, the agents provoking its development act stronger. There are quite convincing invitations to the strengthening of the asymmetry of hemispheres parallel to the promotion of unidexterity. In ambidexters it is, as a rule, less expressed than in unidexters.

It has been also determined that the asymmetric functions arise and lateralize in a certain successiveness. The earliest asymmetric function, disclosing itself already on the sixth-eighth month of life, is unidexterity; though sensory speech develops somewhat later than the motor, still the latter lateralizes first; writing, reading, the visual and auditory gnosis, etc., are lateralized more later. The study of the phylogenetic development of hemispheres gave a sufficiently strong reason to maintain that the phylogenetically asymmetric functions at least function unidexterily; the motor speech, writing, also arise in the same successiveness, also in ontogenesis. This parallelism between onto- and phylogenetic successiveness of the development of asymmetric functions cannot be a wonder for those acknowledging Haeckel's "fundamental biogenetic law." Proved by him in respect to morphologic organization, it is in like degree applied also to the functions determining the structure and the form of organs.

The established successiveness of the inception of asymmetric functions the degree of their unilateralness depending upon age, civilization, and the degree of functional unidexterity, have a very essential importance; evidently every theory tending to explain the appearance of the asymmetric function not in that "*natural successiveness*" of theirs which is mentioned above, and independently of

their state in the representatives of different ages of the cultural development, etc., risks to meet with an insurmountable impediment.

We have mentioned above that from a general evolutionary point of view the asymmetry of hemispheres is a separate stage of development of the nervous system of vertebrates. Evidently the roots of its appearance had to be looked for in the general rules of the development of the nervous system, particularly in the hemispheres of the brain and especially in the *conditions* of development of the latter in man.

We have considerably facilitated ourselves the problem of determining the causes of the development of the asymmetry of hemispheres having shown that the nature of the latter lays in a more perfect development of a series of centers and associative coures connecting them, and from Professor Pavloff's point of view, of the "conditional reflexes" only in one hemisphere, our task consisted, therefore, in determining the causes of a monohemispherical development of a series of "conditional reflexes."

From the rules to which, according to Professor Pavloff, the formation of the conditional reflexes is submitted respectively, the interlaying of temporary anatomic ways between the bodily segments into which the corresponding excitements project, the greatest importance belongs to the law of reciprocal actions of the centers of *synchronic* excitements, which lays in the basis of the formation of a connection between the exciters and *the frequentness* of the synchronal appearance of excitements strengthening such connection. We observe that these regularities lay also in the foundation of the formation of associations.

The examination of facts relating to the phylogenetic evolution of the nervous system shows that the same rules (neurobiotactic agents) also define its development. But by themselves the neurobiotactic agents are mere masons, passive organs, constructing the nervous system, and in particular the organization of each hemisphere: the character of the construction is determined by the material, *i.e.*, by the excitements arising in it and by the conditions in which the neurobiotactic agents operate. If the conditions of actions and the material are similar in both hemispheres, then the final result of the actions must be alike, *i.e.*, the hemispheres will be similarly built or, as is the same, symmetrically, otherwise the probability of an asymmetric development of hemispheres becomes evident. The examination of the evolution of the big hemispheres of the animal's and man's brain in said respect gave us a reply to the cause of the inception of their asymmetry in the latter.

THE CAUSE OF INCEPTION OF ASYMMETRY

The receiving nervous apparatus, the eyes, the ears, the body surface, etc., are such paths by which excitements flow in wide currents into the hemispheres, composing a material for sense and for the structure of the cortex. We possess no positive facts which could show that these apparatuses are in man and animals differently developed on each side, therefore we are right to conclude that both in man as in animals (before the moment of development of functional unidexterity) the material on which the neurobiotactic laws operate is the same. On the contrary, the conditions in which they acted in these and those were different. Animals, as a rule, are ambidextral, therefore the two hemispheres are not only stimulated similarly strongly but act also equally strongly, reflecting from the exterior the absorbed energy in the different kinds of reactions, the motive principally. In other words, the conditions and build are identical in both of them, this resulting in their symmetric organization.

We are convinced that somewhat other conditions acted at the development of each of the hemispheres in man. At a certain very distant period of his phylogenetic history the man began to change into an unidextral being to a certain extent, *i.e.*, one of his upper extremities became functionally predominant. In proportion to the further development this predomination of one of the extremities—the unidexterity—strengthened for account of professional operations, and with growth of civilization chiefly for account of writing. The predominating extremity, and consequently the hemispheres innervating it, acted oftener, more energetically, in performing also, for instance, at writing, such functions which had never been performed by the other hemispheres. In short, in the hemisphere of the predominating hand more intensive, more frequent, and finally such excitation arised which in the other did not appear at all. Hence it is evident that the conditions in which both hemispheres functioned or developed were not the same in each of them, this having had to inevitably lead, owing to the neurobiotactic rules mentioned above, to their unsimilar asymmetric organization. *The qualitative and especially the quantitative differences of the function of the hemispheres dependent on the predomination of one of the upper extremities was the cause of the inception of the asymmetry of hemispheres of the brain in man.* This is a general deduction as to the causes of development of this human peculiarity of their organization.

Those to whom this deduction, determined by us on the basis of

examination of the development of hemispheres, is not persuasive, must apply to Spencer's general principle, already mentioned: from beginning to end function determines structure. One of the hemispheres, the left, in majority, functioned in connection with functional unidexterity otherwise, and besides more energetically and variously, this having to lead to another near complicated structure of it.

But we could not confine ourselves only to determination of this main deduction. Recognizing the prevalence of one of the hands for an agent of origination of the asymmetry of hemispheres, we were obliged to investigate both the mechanism of its lateralizing influence of unidexterity as the causes of its own origination.

THE MECHANISM OF DEVELOPMENT OF ASYMMETRY

In speaking of the causes of functional unidexterity we tried to show that the usual identification of this question with that about the causes of righthandedness is groundless; the cause of predominance of one of the extremities does not quite coincide with those which lead to that the right extremity appeared to be the predominating.

The man's upper extremities are antimeric organs. The appearance of the predominance of one of them is evidently a peculiar example of the functional evolution of antimeric organs.

The facts relating to the evolution of the latter can be embraced by the two following short formulas: *antimeric organs performing at the same time the same function*, respectively, the limbs, the ribs, the eyes, the ears, etc., *are analogically formed*, whilst the *antimeric organs performing at the same time different functions specialize in the direction securing a possibly thorough fulfilment of the respective functions and develop asymmetrically*. When the man has finally fixed himself on the hind extremities and began to use the front ones only as a *seizing* organ, the conditions of his existence were such that he had to adopt these latter to perform different functions at the same time. With one hand—to throw stones, clubs, afterwards lances; to bend bows; to hold stones, spare arrows, etc.

The primitive man, as well as we, observed of course that a repeated performance of a function with the same one hand facilitated him essentially. This repeated use of the same extremity for the performance of a determined function has laid the foundations to the functional specialization of their upper extremities in man which ended in the writing with one hand. The veracity of what has been said of the causes of differentiation of the extremities in man is

confirmed by the circumstance that until now the differentiation of extremities was defined only in those representatives of vertebrates in which, as in man, the extremities perform at the same time different functions: in a determined species of small crabs, fishes, parrots, signs being observed in primates.

CAUSES OF RIGHTHANDEDNESS

As to the causes owing to which the right extremity in man became predominating, the most satisfactory reply among the most various theories is given by that of Astwazaturoff and Weber. They both develop from the leftsidedness of the heart's position, but Astwazaturoff develops from a more close relation by virtue of the community of the level of the spinal cord centers of the innervation of the heart and the left hand thanks to which the movements of the left hand reflect stronger on the work of the heart. It is long ago known that the best observations of this kind are Mackenzie's, viz., the movements of the left hand provoke an attack of angina pectoris more easily than of the right one. We sufficiently know a great deal of somatico-visceral reflexes, for instance, Aschner's phenomenon (the alteration of the heart's rhythm at the excitations of the *Nerv. trigemines*), as to assume Astwazaturoff's point of view. This theory is the more so probable that it finds a certain support in facts.

An extensive material has persuaded us that the movements of the left hand, as well as the sensible excitements of the cutaneous surface in the limits of the eighth cervical and the first and second dorsal segments from the left, provoke more considerable alterations of the activity of the heart than do those of the right side. It is known that the excitement of the nervous apparatus of the inner organs calls out a reflective contraction of a determined group of muscles—viscero-somatic reflexes (defense musculaire, and others). By analogy we may admit that the excited apparatus of the heart performs in normal conditions in a reflex manner an index of the left hand's movement in a larger degree than of the right. The sparing of the left hand in angina pectoris partly rests on this unconscious reflex indication. In the evolution of man it led to a pre-eminent use of the right hand.

As to Weber's theory, we could not consider natural selections as an agent enabling the inception of righthandedness, but doubtless it participated essentially in its strengthening.

So, at a certain period of his phylogenetic evolution, the man entered life as a being possessing a predominating right hand.

THE RESULTS OF RIGHTHANDEDNESS

The results of righthandedness were very various and bore partly a morphologic and partly a dynamic character.

The preëminent use of the right hand in general influenced before all upon its own formation and upon its cortical areas. Its preëminent use in writing and for the accomplishment of the expressive and customary functions led to that the corresponding functions develop only in the left hemisphere. "Kinetic melodies," *i.e.*, the representation about that conjunction and successiveness of small and complicated movements of the fingers, the wrist, the forearm, etc., required for the reproduction of such movements, for instance, the outline of letters or a threatening gesture, are worked out under the control of the eye on the basis of sensory stimuli chiefly from the muscles and tendons entering, owing to a complete crossing of the sensory paths, the left hemisphere only. The development of this kind of function in the left hemisphere is a direct result of their execution with the right hand. Arising here, they perform, owing to neurobiotaxis, a dynamic attraction effect on the rest of the functions, lateralizing them into its hemisphere. The final functional and morphologic formation of the hemispheres is the result of the neurobiotactical reciprocal action between all the asymmetric functions, but doubtless, in this respect, a considerable rôle belongs to writing.

DEVELOPMENT OF ASYMMETRY OF THE MOTOR SPEECH

On investigation of the causes of development of the motor component of speech particularly in one hemisphere, we come to the belief that originally it was realized by both hemispheres. The plausibleness of such an admittance is justified by the bilaterality of the functions of the phonative communion in animals, and also by the less sharply expressed unilateralness of this function in children. We have considered the opinions of eminent investigators about gesticular language as having preceded the teaching of speaking and accompanied the first stage of its development. As the scarcity of words the originated man had to apply for purpose of communion to a wide use of gestures, a language comprehensible to all: "*omnium hominum communis sermo*, . . ." using Quintilian's words. We have also produced many proofs that gestures were chiefly made with the right hand. This coincidence of innervation of the right hand and of the muscular mechanism of speech had to contribute, owing to neurobiotactic reciprocal action between the corresponding cortical centers, to a more perfect development of Broca's left-sided center.

For those, whom the lateralizing influence of writing upon different components of speech, the understanding of this process cannot be of any difficulty. The gesticulating language is a kind of writing, not on paper, but in the air. The differences of material on which the written and gesticulating signs are brought do not contain such conditions which could lead to a different effect of gestures and writing on the mature component of speech.

Thus, the unilateral development of the praxic functions is in close dependence from functional unidexterity.

But praxic functions, *i.e.*, centers represent the working of the cortical centers, reflecting outside the energy of external excitement furnished to it by the receiving apparatuses of the nervous system. We observed that they are concentrated or better developed only in one hemisphere, a circumstance which evidently created quite different conditions for working out gnostic functions in each of the hemispheres.

THE ASYMMETRICAL DEVELOPMENT OF GNOSTIC FUNCTIONS

The peculiarities of gnostic functions consisted in that the excitements from which they originate—the visual, auditory, olfactory, etc.—enter both hemispheres. We have no convincing data to suppose that the quantity and the intensity of such excitements entering both hemispheres differ, and if normally the gnostic functions develop particularly or in any case more fully in one hemisphere only, then this was due to some particular conditions and causes. We have shown that these conditions lay in the unilateralness of the praxic functions. The excitements entering the cortex of the left hemisphere in the righthanded usually find here various centers of synchronous excitements in the praxic centers, and therefore, owing to a neurobiotaxical reciprocity with them, hold more strongly in it, forming easier different associative coherences.

When writing we reproduce the written words in our mind. In such conditions centers of excitement arise in the left hemisphere both in the center of writing as in the center of motion, as well as in the center of the sensory speech, absent or weakly expressed in the right hemisphere. Of the visual excitements arising in both hemispheres, only the left hemispherical can evidently enter into coherency with the said excitements, this guaranteeing its strengthening and conservation, respectively, the development of the center of the visual shapes of letters and words, particularly in this hemisphere. A similar mechanism, as we have observed, operates also for the development of all the other gnostic functions.

AGENTS FORMING THE ORGANIZATION OF THE BRAIN

We see that the matters from which the gnostic functions are produced (except stereognosis) are similarly brought by the receptory apparatuses of the nervous system into both hemispheres.

In this respect the receptory apparatuses tend to transform the hemispheres into structures symmetrically organized. On the contrary, righthandedness and motor speech transform them into asymmetric structures. Generally speaking, the organization of hemispheres is the result of reciprocal action of these two agents. More the righthandedness is sharper and the leftsidedness of the motory speech complete, the stronger is their lateralizing influence, consequently the unilateral development of these gnostic functions is larger. From the point of view of this reciprocal action many peculiarities of the asymmetry of hemispheres in the representatives of different ages become clear. We have observed that righthandedness increases with age (to fourteen-eighteen years), that in woman it is less expressed than in man, and in uncivilized less than in civilized. Owing to this, the asymmetric development of the gnostic functions is also less strongly expressed in them likewise; the fact that the asymmetry of the gnostic functions appears later than the praxic is explained from the said point of view: prior to their displacement into one hemisphere a factor must arise (praxic centers) which produces such a displacement.

THE FUTURE OF ASYMMETRY

Having established that righthandedness or, better, functional one-handedness, is the nearest cause of the apparition of the asymmetry of the hemispheres, we can satisfactorily solve some other questions concerning its development. Respecting the future of the asymmetry of the hemispheres, we are firmly convinced that it will remain in man until the functional specialization of the hands is present in him, *i.e.*, the prevalence of one of the extremities. However, we can by no means agree with Liepmann's or Stier's opinion that mankind has finally and irrevocably stopped on the path of asymmetric development of hemispheres. The law of causality allows to admit that the removal of the agent which provoked it, *i.e.*, functional unidexterity, can lead to its relaxation or disappearance. Many facts regarding the involution of the symptoms and nature of the organization of an animal make this supposition more than probable. As to the turning point in the symmetric development of the hemisphere of vertebrates, we have concluded that such point was that moment of the phylogenetic history of mankind when it finally strengthened on the hind

extremities, deserving to be termed "erectus." The orthogravity securing the possibility of a functional specialization of its upper extremities is the "primum movens" of the asymmetry of hemispheres.

The examination of facts relating to the causes of the asymmetry of hemispheres and to the mechanism of its development decidedly prove that it is a *passive* result, a simple result of the functional predominance of one of the extremities. Its appearance in man is not a mysterious privilege or a realization of some expedient principle, an opinion expressed by some biologists. The investigator, who would like to make himself a satisfactory idea of the importance and especially of the expedience of the asymmetry of hemispheres, should always have this passive genesis in view.

We esteem that we have proved that in the development of this *human* peculiarity of the organization of the nervous system of vertebrates the same agents do act: the coöperation or reciprocal action of different forms and intensities of energy, as in all the organic world, and also that, that like the animal organism is a plastic material in the hands of the surrounding medium, in conformity to which its organization is composed, so the nervous system, and particularly the hemispheres, are a plastic material in the hands of the centers of excitements arising in it under influence of inner and outer excitements.

The evolutionary theory expressed in this research could be called "*a natural history*" of the development of the asymmetry of the large hemispheres of man's brain.

In summing up the whole, we may say that the totality of facts relating to the asymmetry of hemispheres, their onto- and phylogenesis, the degree of asymmetry, and the successiveness of the inception of separate functions, has been more or less satisfactorily explained (in the degree attainable by our actual knowledge of this subject) from the point of view of one principle: righthandedness and the neurobiotaxic reciprocity between the centers of excitement dependent on it. This generality of the explanation of the ensemble of phenomena from the point of view of a single principle makes this latter, as a cause and a factor of the arising of the asymmetry of hemispheres, more than probable. In any case just owing to this generality we can consider the hypothesis about righthandedness and the reciprocity between cells or centers of excitement as a cause and a mechanism of development of the asymmetry of hemispheres, as corresponding more fully to the facts known to us of it from modern science treating the matter in question.

PHOTOGRAPHED LILLIPUTIAN HALLUCINATIONS

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The case here described manifests typical lilliputian hallucinations corresponding in every essential detail with those recently described by French psychiatrists. In addition there is very clear evidence for a theory in terms of a peripheral origin and the curious results of the subject's attempt to photograph his hallucinations offer additional material of unusual value for the theoretical interpretation. Although I never had the opportunity for even a brief personal interview with the subject I have an extensive correspondence with him, and I have still in my possession some of his unique photographs. I am quite certain that he had never been under the observation of any competent psychologist or neuropsychiatrist up to the time of the cessation of my correspondence.

The lack of personal contact, of course, precludes the presentation of the usual case history. From the letters I judge that he must have had at least a common school education, that he had read considerably, that he was very religious and much given to thinking on religious or theological subjects. When the correspondence was first opened he was employed in a humble capacity by a manufacturing company. Soon after that he moved to another part of the country and thereafter moved several times during the course of our correspondence. I judge that he was a man of least mature years. Since the period of this correspondence I have entirely lost track of him. While the lack of personal contact is regrettable it nevertheless makes it possible for me to present the essential details in his own words.

The following excerpts from his letters present the phenomena clearly:

"When I sit down or lie down, day or night, and close my eyes, I seem to be in a different realm, though still awake, and can open my eyes at will. As I close them the vista and perspective broadens and opens out, mountains, sometimes, appear on the distant horizon, hills and valleys come and go, trees with the most delicate green leafage imaginable appear gently shimmering in the shadowy glow, and then passing to and fro, in this mysterious land the forms in human shape that I call spirits begin to make their appearance. . . . They are all happy as they pass in review before my vision,

and smile sweetly as they look my way. They converse by thought transference instantly expressed in a most silent manner from mind to mind. . . . Mere volition or motion in these forms show what they are. . . . I have seen herds of elephants and cattle, horses and mules, lions and tigers, wandering around the pastures and jungles of my vision. I have seen the most beautiful birds in the trees and bushes. Often I have seen in the way I have already described, still pelucid ponds, and lakes, with the ripples gently laving the shore, where the fish swam gracefully to and fro, and I have also seen the mighty whale and other monsters of the deep sporting in their own element. . . . Harm cannot come to one of these forms for they are the slickest magicians that ever came down the pike, for they can vanish so quickly that even I sometimes can hardly detect the change. They have amusements that are astonishing and unique. They love to appear masked, the mask over the face taking the head and features of some hideous animal and so closely simulated that it cannot be observed, until they drop it themselves, and assume their natural characters. They love to run machinery, I have seen long trains of cars running on rails with an engine front or rear and all of the cars loaded with material. They hitch up the horses to carriages and ride by in state several forms occupying one vehicle. They have queer little horseless carriages of their own invention. They love to climb trees and do acrobatic stunts in the air that is simply amazing. They move through their medium or air in any position that they desire to assume. . . . You will find them young and old, you will find that the females predominate just the same as they do here. . . . I control these subjects to a certain extent, but I never take any advice from them nor do I give any. I have tried to draw them out on subjects of astronomy, art, literature, and inventions but to no purpose. They have shown me crude inventions of their own which would be utterly useless, here they are all very simple minded. I have seen them in vast throngs passing me by, to where, the Lord only knows. The bluest of blue eyes with the sweetest little oval faces have come out of the great somewhere, and within six inches of my face have looked me over with infinite sweetness and then slowly vanished."

Requests for further information brought forth instructions for observing these forms for myself which incidentally throw more light on the case. He says:

"If you desire to see these forms as I see them when you lie down to rest at any time compose your mind, close your eyes and look into the darkness in front of them, keep your mind on what you are doing and gradually the mystifying shadows in front of your closed eyesight will begin to dissolve, the vista will broaden and open out and if you are apt, you will see the strangest things you ever saw in your lifetime. . . . If you can see these forms with your eyes closed as you become more adept you will see them with your eyes open, but not so clearly. . . . If you succeed in doing so and see them, they will draw closer to you in time and then you will feel the soft imprint of spirit hands upon your person. . . . The spirit hands are of all sizes, and if you ever feel the touch of one you will find them the softest thing you ever encountered. On my person they

never go below the belt. A favorite amusement with them, is to comb your hair, curl it, run their fingers through it, or if they become vexed with you, to pull it. The longer they work at it the harder you will feel it."

The cutaneous complication observable in the last lines above is noteworthy. Most of the presentations available of lilliputian hallucinations¹ are primarily visual with occasional auditory phenomena. In a personal communication, however, Dr. Leroy tells me that he has already observed the combination with cutaneous hallucinations.

The author of these letters was thoroughly convinced that he had made a great discovery or that he was peculiarly endowed. For him it somehow meant a proof of immortality and he sought means for extending his conviction. It occurred to him that he might be able to photograph these spirits and thus with a photographic record be the better able to convince the world of their objective reality. This he proceeded to do. For some reason not given he decided to use a plain background. This he photographed and then proceeded to examine the prints made from such films. He says: "My photos were taken on plain paper, blue, white, black, and other colors . . . a few of the prints were taken on cloth blue over red." Of some of them he says that the exposure was made in an almost "dark room for five minutes at a 100 ft. focus four and one-half feet from the kodak." The films and prints thus obtained he examined with great care and the aid of a magnifying glass. He found that for which he was looking—reproductions of a vast variety of these little figures which had so interested him.

I examined a large number of these which he submitted to me, I suppose in the neighborhood of fifty or more. These prints, of which I still have two, are three and a half by five inches in size and are a little darker than a neutral gray. They show that the field photographed was somewhat unevenly lighted. Some show faintly the texture of the background. A casual inspection reveals nothing more, but an examination according to his directions does reveal ladies' heads, isolated arms, hats, dogs, and a great variety of other items. The largest figure on those I now have, and they were among the best, is not much over half an inch in diameter. Most of them are much smaller. But his directions are the illuminating feature and they follow in exact quotation:

¹ The best available bibliography on the subject is to be found appended to the following admirable summary of the literature: Leroy, R., *Le syndrome des hallucinations lilliputiennes*. *Le Monde Medical*, 1922, 32, 245-258. The best summary available in English but unfortunately without bibliography is to be found in the *JOURNAL OF NERVOUS AND MENTAL DISEASE*, 1922, 56, 325-333, which is a translation of a part of the above paper.

"They have literally packed each photo so that whichever way you turn it you will see them if you have the patience to pick them out, wherever you see an apparent distortion of a face follow it to a conclusion, through its different combinations and then you will see the real face or several of them all in a bunch . . . you will have to use a glass to detect them. I use a cloth magnifier. . . . To study them correctly hold them to the light, the light of day is the best facing a window through which the sun is shining. I have obtained the best results with a deep cigar box with a square of post card size ground glass, or plain glass will do. A square hole is then cut in one end of the box large enough to admit an ordinary Mazda lamp. . . . The print placed on the glass will then partially reveal its contents. . . . When you look at some of these prints do so as if you were looking inside the print itself and gradually a perspective will be formed in which the figures will stand out more plainly."

His directions reveal the explanation. They are the perceptive illusions of the expectant variety so well known in general psychology. Slight stains in the film (well known to roentgenologists) produced these slight variations of grayness in the print which an expectant mind can readily perceive as meaningful forms. Discovering them is a process quite like the torturous one of "seeing the lady in the moon." Only a mind so dominated as his would ever have discovered them in the first place, but once discovered and so interpreted it is quite possible to make any intelligent person perceive them also by properly preparing the set of mind.

On the whole these hallucinations correspond to Leroy's descriptions. They are diminutive, in natural colors, in three dimensions, are active, and are agreeable. He says that he has "seen them since he was a little boy, when they used to scare me going to bed in the dark." This is the only indication in his letters of a disagreeable affective reaction, and may of course be due as much to the dark as to the little figures. The only other evidence in his letters of hallucinatory phenomena is the following:

"When I am lying down to rest, with my eyes closed I often see hand writing, which passes before me in long lines above and below each other, but they are so indistinct and move so fast that I have not been able to read and understand them. They pass from left to right. Sometimes the writing is in a fine hand, and at other times it varies."

It is well known that many hallucinations seem to be satisfactorily explainable in terms of an obscure peripheral stimulus followed by free association. So far the assumption of a peripheral factor in lilliputian hallucination seems not to have been indicated by the clinical evidence. But in this case it seems inescapable. As the reader has already doubtless observed this man constantly mentioned

the closing of the eyes followed by the "mystifying shadows" and the gradual appearance of the rapidly moving images. Idioretinal light was evidently the beginning of the process. Leroy observes the existence of the syndrome in hypnagogic states, quoting from Maury, but turns from it to theorize in terms of the unconscious. Here, however, we have a case beginning as hypnagogic and developing into full fledged hallucinatory phenomena experienced with the eyes open and the hallucination projected into the visual field. Leroy leans to a toxic theory for the syndrome, some poison directly affecting the cortical centers. Whether or not the toxic theory could be applied in this case I do not know for lack of detailed knowledge of the personal and medical history, but it seems unnecessary unless one thought the assumption of some abnormal degree of retinal activity to be indispensable. Even then the toxic effect would be peripheral and not central. If one could accept at its face value, which is probably unwise, the subject's statement that he had seen them since he was a little boy the toxic theory would become still less probable.

Why the diminutive size of the hallucinated figures remains to be explained. Salomon² has offered a theory which so far as it goes is sustained by this case. Salomon thinks that imagination takes place with a setting appropriate to the central figures of the imaginative content. If then these central figures be projected into the outside world, be brought unchanged from an imaginal into a sensory setting, then the magnitude of the imaged figures may be out of proportion. Thinking in terms of this theory immediately suggests the possibility of such hallucinations being of any size from the gigantic to the extremely diminutive. And such cases are well known to readers of clinical literature. My own subject reported hallucinations of different sizes. In describing his first experiences with them when his eyes were open, he says: "I was surprised to see how small they could make themselves. The figures would assume any proportions, from three inches on up through the scale up to full height." Perret³ reported cases in which hallucinated objects of normal size occurred alongside of lilliputian hallucinations. One recalls, of course, in this connection the projection of the negative visual after-image and its variation of size with the distance of the field of projection. If, however, instead of a mere visual after image we substitute a visual

² Salomon, Jean. *Hallucinations lilliputiennes. Essai d'interpretation.* Soc. med. psych., 1922. I regret that I have been unable to see the original of this. My knowledge of it is gained through the abstract given by Leroy. I trust that I do Salomon no injustice in consequence.

³ Perret, A. *Sur un cas d'hallucinations lilliputiennes.* J. de psychol., 1923, 20, 459-465.

perception well developed around some relatively obscure visual process, such as the idioretinal light, then the projection might not be influenced by the proportions of the field into which it was projected. This assumption is firmly supported by Miles study⁴ which most dramatically demonstrates the dependence of the nature of the projected image upon the attention or governing attitude. And in this case the theory is supported by the subject's own statements of his much occupation with the images prior to the projection of them into his sensory visual field, as well as by the quaint results of his photographic procedure. In the previous quotations will be found sentences indicating that the experience of these lilliputian hallucinations with open eyes was a considerably later achievement, subsequent to much attention to them. In another place he says also: "Several years ago I began to cultivate the acquaintance of these forms more and more, and as time passed on I began to see them more distinctly. . . . I began soon to see them with open eyesight in the daytime especially on plain surfaces." And there are indications to be found in the quotations given that the attempt to see them with his eyes open was not at first entirely successful. In his advice to me he says that I will not see them as clearly with open eyes. If this theory is even approximately correct then one would expect that the subject would have recognized in his photographs at least some of these diminutive creatures with which he had been so much concerned. When questioned about this he replied: "I have recognized forms on my photos, seen with the naked eye and also with the eyes closed, but I could not prove it unless I had the identity of the character in question before me in solid form, to my mind it is a certainty." Salomon's theory then seems to fit the case very well.

Leroy has pointed out that Salomon's theory does not explain the agreeable affective accompaniment and suggests that the agreeableness is due to the infantile fairy-like nature of the hallucinations. In other words they are agreeable because they are amusing. There is nothing in my case to contradict this theory, and obviously much in support of it. But I would point to what seems to me a more serious defect in Salomon's theory: It does not after all explain why the image is lilliputian. It merely shows the possibility of a projected image failing to correspond with the spatial proportions of the sensory field. Why the image should have developed in other than normal spatiality is not explained. My subject reported them of various

⁴ Miles, George H. The Formation of Projected Visual Images by Intermittent Retinal Stimulation. Part 1. *British Journal of Psychology*, 1914-1915, 7, 420-433.

sizes from normal down. Perret, mentioned above, reported a case with hallucinations of normal size along with a few very diminutive ones. Apparently my case was aware of the diminutiveness prior to seeing them with open eyes. What governs the size still remains a problem. Perret has offered an explanation which implies a psycho-analytic influence. He thinks that his patient's "genie" always has a definite meaning which is in the nature of a defense reaction to current thoughts and feelings, that his patient does not seek to explain his sufferings by rationalization which has the appearance of logic because he is incapable of logical reasoning; rather does he find refuge in the supernatural of his imagination. It is an escape from a persecutory reality and is thus in an unreal and amusing form. I have been unable to discover in all the correspondence with my subject any definite indication of such a defense reaction although the whole thing may have been of the nature as Perret's case apparently was.

Recent studies in general and genetic psychology, however, offer another alternative which is more consonant with the known facts in this case. In Koffka's summary of the Gestalt psychology⁵ we find ample evidence for assuming that the child's first experiences of figure and ground are evidently of different magnitudes according to the distance of that which at different times is experienced as the figure. Constancy of magnitude is a gradual acquisition through the course of maturation and learning. Eventually in the normal individual a given figure at whatever distance, whatever the size of the retinal image, will be experienced as of the same magnitude. Many studies in recent years have shown the possibility of breaking up, partially or completely, our acquired syntheses. Janet's studies in particular have demonstrated this, and we have come to think of such disturbances of synthesis as attributable to either organic or psychogenic causes or to both. In these cases of lilliputian hallucinations there is evidently a disturbance of that synthesis which will normally maintain a constancy of magnitude for any object or class of objects. There is a reversion to some stage in which the constancy of magnitude was yet imperfect. The imaginal appearance of these imperfect magnitudes constitute the material for the development of the lilliputian hallucinations. Assuming this, one may add to it Salomon's theory and find a very satisfactory explanation of the phenomenon. Whether the disturbance of that synthesis which produces the constancy of magnitude is to be attributed to organic conditions or to

⁵ Koffka, Kurt. *The Growth of the Mind*. N. Y., Harcourt, 1924. See especially pages 284 et seq., but the whole volume should be read for the background.

psychogenic causes depends upon the findings in any given case. Here is where Perret's psychoanalytic suggestion would apply if at all. In some of the cases reported by Leroy the organic factors are so prominent it would seem more reasonable to attribute the disturbed synthesis to the organic disturbances; but in the case I have described there is no evidence directly available for an organic interpretation. There is on the other hand the evidence of a long study of conscious magnitudes. He delighted in them, especially in the images of imperfect magnitude; he worked over them; he sought for them in his sensory visual field; he made many photographs and laboriously studied them for reproductions of his images of imperfect magnitude. It seems more likely that this is a self-induced break-up of the synthesis. There is also the statement about his having studied them since childhood, which if true would hint that perhaps the synthesis producing constancy of magnitude had in his case never taken place completely or in a wholly normal manner.

In brief then my case shows clearly the presence of a peripheral sensory factor, and offers ample evidence in support of Salomon's theory of a projected image without adjustment to a differing spatiality in the sensory visual field. In its affective reaction it agrees with Leroy's and Perret's cases, and seems to support Leroy's theory that the agreeableness is due to the fairy-like nature of the phenomena. It has been further pointed out that Salomon's theory apparently does not explain the occurrence of the lilliputian images prior to their projection. This has been here attributed to a disturbance, either organic or psychogenic, of that synthesis which normally produces a constancy of magnitude however the size of the retinal image may vary. The break-up of the synthesis permits the recurrence of images of diminutive magnitude from experiences prior to the development of the constancy of magnitude. In this case the preponderance of evidence is in favor of a psychogenic origin of the disturbed synthesis, but lacks evidence either for or against Perret's suggestion in terms of psychoanalytic theory.

THE AFTER CARE IN THE MENTAL HOSPITAL OF ERLANGEN, BAVARIA, GERMANY

By DR. KOLB, M.D.

OF ERLANGEN

From 1908 till 1911 I established ex-service at Kutzenberg, since 1913 at Erlangen. The public mental hospitals must do everything in their power to facilitate the return of their patients into every-day life. To obtain this, social care for the dismissed is indispensable. If practiced by the physicians and female attendants of the regionary mental asylum, this care will be of greatest value for the mentally ill as well as for the hospital and its directors, for science, and for the public: For the mentally ill because the treating physician, being fully acquainted with the former life and family life of the patient, with the course of his disease as well as with the dangers threatening him, is the best social adviser. For the hospital because social activity puts the physician, who is often forced to retain the insane in the asylum against his will, into a helping, truly medical relation with the patient and his family. For the director of the hospital because in this way it will be best enabled to become acquainted with the abuses which may have crept into the institution. For science because the competent physician is informed by after care of the mental structure of the patient's whole family, a factor important from a hereditary and biological point of view. In addition, he permanently supervises the complete course of the patient's life instead of observing his transitory affection only. For the public because the physicians of the hospital can dare to dismiss the patients much more frequently and earlier, if they are sure that the mental disorder continues—even after dismissal—both to be subject to the consultation of a specialist and connected with the institution. The after care has taught us that chiefly those patients suffering from dementia precox can relatively often live among their family on condition of effective special consultation, and display greater activity of mind than in the best mental hospital. In case of suitable after care the periodic psychoses can be dismissed on parole immediately after the abatement of acute periods. With regard to alcoholics and certain groups of psychopathic personalities ex-service was particularly successful. When the family of a patient moves dismissal on parole for him,

the ex-service physician examines the domestic situation of the family (lodgings, their attitude towards alcohol, possible employment of the dismissed, etc.). If this situation is somehow satisfactory, dismissal on parole is approved of in case that the patient is neither dangerous to a high degree, nor endangered. The family as well as the patient—as far as patients settled in some measure are concerned—are obliged to acknowledge in writing certain engagements. On the very day of dismissal, at the latest on the following day, the ex-service physician or the female attendant visits the patient dismissed, the visits being frequently reiterated in the beginning, less frequently later on. When disturbances occur, the patient is readmitted in the hospital, but the attempt of temporary dismissal is, at the family's request, repeated, even several times in proper cases. In nearly all cases the return to the hospital is performed without any difficulty. It occurs very seldom (in less than $\frac{1}{2}$ per cent of the cases) that ex-service care is refused by the patient or his family. The hospital can afford to give pecuniary aid to the patients subject to ex-service (one thousand marks were granted for 1924). Besides, the public pauper relief has authorized us to accord, in case of necessity, to the patients temporarily dismissed for three months 60 per cent of the asylum costs of maintenance—190 marks for each dismissed patient.

The ex-service has gradually developed from small beginnings. At first, I myself managed it. A female attendant, and occasionally the physicians, visited the patients dismissed to their lodgings. Its full development was attained by ex-service only when, in 1919, the head physician, Dr. Faltlhauser, was charged with it. Being a physician at the same time as human as energetic. Dr. Faltlhauser is excellently suited for this post. A second female attendant was engaged in 1921, a third one in 1923, and a fourth one in 1924. Towards the end of 1924, a second physician was provisionally appointed to the ex-service.

Year	Number of ex-service patients under treatment during the year	Number of visits	
		Total	By Physician
1913 }	103	335	
1914 }			
1915	102	429	
1916	113	549	
1917	129	544	
1918	170	747	
1919	329	2,184	
1920	449	4,963	1,052
1921	552	6,985	1,721
1922	828	8,504	1,959
1923	1,093	9,404	1,752
1924	1,466	12,051	2,002

Diagnosis of ex-service patients 1924: Manic-melanchol. 276 = 18.8 per cent; dem. prec. 314 = 21.4 per cent; general paresis 26 = 1.8 per cent; arteriosclerot. and sen. 34 = 2.3 per cent; epilep. 55 = 3.7 per cent; hyst. and psychogen. 120 = 8.2 per cent; psychopath. pers. 315 = 21.5 per cent; idiot and imbecil. 79 = 5.4 per cent; alcoholism 171 = 11.7 per cent; all others 76 = 5.2 per cent.

The admission territory of the asylum of Erlangen comprises the towns, being situated close together, of Nuremberg, Fürth, Erlangen, and environs with about 500,000 inhabitants. For Germany ex-service is particularly important, because at present Germany is not in a position to defray the expenses of the quartering of numerous mentally ill, and especially it cannot afford to build new mental hospitals.

CLINICAL ASPECTS OF MENTAL DEFICIENCY

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Although more comprehensive studies of mental deficiency emanate from institutions for the feeble-minded, it was thought that a report from a clinic where, daily, feeble-minded are examined would present data of interest. This report is based on several years experience as examining physician at the Mental Clinic of the Department of the Public Welfare of the City of New York. Mental defectives and epileptics are referred to this clinic for disposition to the various institutions. Individuals who are suspected of mental disorder of one type or another are also referred here for diagnosis and recommendation for further care.

The clinic has averaged about 1,300 new cases a year in the last three years. About one-half of the number were diagnosed as mental defectives. About 10 to 15 per cent of the total were epileptics (this included the mentally deteriorated epileptics). A small percentage represents those classed as psychopaths and postencephalitic conduct disorders in children. The remaining number were considered as borderline types of mental deficiency, dull normal and normals.

In the report rendered for the year 1923, the following figures were given:

Total number of new cases examined.....	1,375
Mental defectives	772
Normal.....	206
Dull normal or retarded.....	26
Borderline.....	68
Psychopaths.....	40
Post-encephalitic conduct disorder	8
Epileptics.....	196
Undetermined.....	77

The patients represented a cross-section of the various races, foreign born as well as native born constituting the population of the city. Commitment papers were drawn up for such cases as warranted institutionalization.

The patient is accompanied by one of the parents or nearest relative from whom the history is obtained by the examining physician. A history taken by a physician affords an opportunity for closer questioning and more proper evaluation of data obtained. The

family history is inquired into in as detailed a manner as possible. The information obtained about the family history rarely extended beyond the generation of the patient's grandparents. The type of birth, medical and developmental history of the patient are subjects of careful inquiry. One must be guarded in accepting the statements as offered by the parents. Trauma which is frequently given as a cause of mental deficiency is often an incident in the life of a mental defective. The history of "difficult birth" and "blue baby" is often a matter of personal interpretation. More satisfactory information is usually obtained about the child's reactions at home, in school and in the street.

The patient is given a psychometric test (Stanford Revision) by the clinical psychologist and returned to the examining physician for a general physical and neurological examination. The diagnosis is established after the examining physician has completed a psychiatric or mental examination and has consulted with the psychologist.

In this psychiatric examination the patient's habits and character are open to investigation. It is conducted in the manner of a friendly conversation centered about the patient's sphere in life and interests. The character of his judgment, reasoning and the other so-called "higher intellectual faculties" is revealed by centering his attention about such phases of his existence as would elicit pertinent information. He is led to give evidence of his scholastic attainments by tactfully placed tasks. Some of the factors which may influence the results of the psychometric test as restlessness, poor environment and emotional instability are thus compensated for and partially overcome. Especially helpful is this type of examination in the higher grade mental defectives and borderline group when the question of institutionalization is considered.

The patients are classified according to the generally accepted standards of idiot, imbecile, moron and borderline. The high grade moron is often regarded in the light of his possible adjustment to such environment as is afforded. One who will do well at home and be self-supporting in some measure is often considered as borderline. The members of the borderline group present very strikingly the problem of environmental adjustment. One always feels that a place can be found for them outside of an institution unless they frequently come into conflict with the law.

The classification of mental defectives based on other factors than mental reactions is as yet unsatisfactory. Tredgold has classified mental defectives or amentias, as he terms them, into primary and secondary aments. The primary aments are considered as products

of a defective germplasm due to morbid heredity and constitute about 85 to 90 per cent of the cases. The secondary aments constituting about 10 to 15 per cent of mental defectives show no morbid inheritance and no inherent inability to develop but the growth of a portion of the brain is interfered with or arrested by disease or other adverse environment. He also mentions an intermediate or developmental group in which the patient is well until the advent of "an illness," "fright" or "fall." He also finds morbid inheritance to be present in this group.

Authorities in general have stressed the importance of morbid heredity in the causation of mental deficiency and have considered the other etiological factors to play a smaller rôle.

On studying the histories and neurological examinations of the patients in the clinic, it was found that the cases would not lend themselves to the numerical divisions of Tredgold. Morbid heredity was not found to be so common in our clinic cases; it was found as often among those classed as primary aments as in the secondary aments. Examples of morbid heredity in the histories were often open to suspicion of senility or organic disease of the brain. Again, about one-half of our patients showed clinical evidences of involvement of the central nervous system, *i.e.*, pyramidal and extrapyramidal signs, cranial nerve defects and abnormal size of skull. The association of definite neurological signs and mental deficiency both dating from early infancy can undoubtedly be attributed to the same cause in most cases. This latter observation would apparently serve to increase the number of secondary amentias far above Tredgold's figures and would also serve to accentuate the important rôle of such adverse environment as infectious disease and degenerative processes of unknown etiology unrelated to morbid heredity.

In order to further study the apparent discrepancy between the observations in our clinic and Tredgold's, an arbitrary classification was adopted based on the presence or absence of clinical evidence of central nervous system involvement. The patients were placed in either group dependent upon the signs but regardless of history of possible cause or of morbid heredity. The evident purpose of this classification was to discover the approximate numerical relationship between the two groups and the approximate number of cases to which no apparent cause could be assigned. It was also hoped that this classification would offer suggestions for further study into the etiology and pathogenesis of mental deficiency.

The number of cases studied was 175, representing consecutive admissions to the clinic during several months of the past two years.

Group (1) presenting clinical evidences of central nervous system involvement consisted of 87 cases. Mongolian imbeciles, congenital luetics and definite endocrine syndromes were considered admissible to this group to make it more inclusive. Group (2) presenting no clinical evidences of involvement of the central nervous system consisted of 88 cases.

It is recognized that this classification does not permit of positive conclusions or statistics but it is probably suggestive of interesting leads for further study. The ages of the patients varied from one and one-half to twenty-seven years, the greater number being below the age of twelve years.

In group (1) the following clinical diagnoses were made:

Cerebral diplegias and hemiplegias.....	34 cases
Post-infectious.....	16 "
Endocrine disturbances	6 "
Mongols.....	5 "
Microcephalics.....	4 "
Hydrocephalics.....	5 "
Congenital luetics	3 "
Post-traumatic.....	1 "
Tuberous sclerosis	1 "
Unclassified.....	12 "

A detailed analysis of this group is unnecessary for the present occasion. Pathological studies of cases belonging to this group have been extensive but the pathogenesis of many is still unsettled. This especially applies to the mongols, congenital hydrocephalics and a large group of the cerebral diplegias. The still unknown etiology in these conditions apparently antedates birth and its possible consequent trauma.

The histories of most of the cases of cerebral diplegia did not point definitely to difficult labor, three of 17 cerebral diplegias were microcephalic, blind since birth and had bilateral optic atrophy. The hemiplegias could usually be traced back to a fairly definite period when the child had an acute infectious disease often accompanied by convulsions. This period was usually before the age of two years.

In the postinfectious subgroup scarlet fever, cerebrospinal meningitis, pneumonia and poliomyelitis were mentioned as the diseases following which a definite change in the mentality of the patient was noticed. In the remaining number of this subgroup no particular disease was mentioned but in a few the history and symptoms though vague, suggested encephalitis. The physical signs noted were unilateral or bilateral pyramidal tract signs and definite cranial nerve involvement.

In the subgroup considered as unclassified, the physical examination revealed a variety of signs significant from the neurological standpoint, but would not definitely fit into any classical neurological entity.

The diagnosis of tuberous sclerosis was made in an individual of twenty-seven, who was considered as feeble-minded and epileptic since childhood. Symmetrical tumor masses were found in the skin of his trunk and extremities.

The definite endocrine syndromes consisted of 5 cases of dis-pituitarism and one cretin.

In the entire group, morbid heredity was elicited in the histories of only 17 cases.

In an analysis of group (2) morbid heredity was elicited in the histories of 15 cases. No special significance is placed on the number of instances of this finding in either group except that morbid heredity does not appear to be more frequent in one group than in another.

In 9 cases of group (2) a definite change in mental development followed trauma. In each of these instances, trauma as an etiological factor was considered as valid because the child fell from a considerable height or because the patient's condition required removal to a hospital. In each of these instances the trauma occurred between the ages of one and two years except in one case at the age of ten years. In this latter case the previous mental development cast suspicions on the ultimate importance of the trauma. The absence of physical signs at the time of examination does not necessarily invalidate the possible importance of the trauma.

Mental deficiency following one or a limited series of convulsions accompanied by fever occurred in four cases. These convulsions occurred before the age of one year. In four other cases the convulsions first appeared between the ages of one and two years and recurred at infrequent intervals for a period of one year or more. The question of epilepsy enters into the diagnosis of these latter cases. More important than the question of epilepsy is the importance of infectious disease which undoubtedly brought about the convulsions as cerebral complications and the subsequent lack of normal mental development.

A large group of 59 cases remained for which no apparent etiology could be assigned. In 13 of these, the history of difficult labor was obtained. The pathology of group (2) is still unsettled and under investigation. The grosser anomalies that have been described do not account for the lack of mental development in most of the cases. Similar instances of gross anomalies have been discovered in the-

brain of individuals who were considered to be possessed of normal mentality.

The study of the cellular elements of the cortical layers of the brain carries promise of much that will be helpful. Tredgold and others have described a loss and diminution in size of these cells with disturbance of architectonic arrangement, loss of tangential fibers and abnormal pigmentation of cells. The numerical studies of these finer structures will probably yield more information when the normal cortex is better understood.

The part played by fetal encephalitis is still in question although of late it has received renewed interest. Infectious diseases in early childhood may act directly on the brain by giving rise to encephalitis or meningoencephalitis and secondarily disturb the sympathetic and endocrine system giving rise to their usual symptomatology. There is as yet little known of these effects.

The action of chemical toxins on the fetal and infantile brain is still little understood. It does not appear, however, to play a prominent rôle in the pathogenesis of mental deficiency.

The infantile brain may be considered to be in a formative state and to react to lesions in a different manner from the adult brain. After a convulsion, infectious disease or trauma, the adult does not give the picture of retarded mental development that is sometimes shown by the younger child. The difference in reaction must lie in an organic change of a permanent nature in a tissue that is still undergoing development.

A large group of the cerebral diplegias, as Collier has lately stated, have a pathogenesis that antedates birth and does not appear to be related to trauma or infectious disease. Collier considers the etiology to be a neuronc degeneration with selectivity for the tissues involved and self-limited in progression. One may hypothecate that a similar process is at the basis of many cases of mental deficiency.

It is difficult to explain the absence of physical signs in many of the cases of mental deficiency where the history pointed to infection or trauma with its consequent organic change as a cause. The absence of encroachment or sufficient encroachment on the motor pathways may account for this.

Mental deficiency in both of the groups mentioned appears to be due to a process which is self-limited in progression. The mental defective rarely actually becomes worse. Most of the mental defectives are amenable to care and training and show that they profit by it.

It is to be regretted that serologic and X-ray studies were not included in the clinic routine, although in many of the cases, these

investigations had been completed before the patient reached us. Where especially indicated these studies were carried out at the request of the examining physician.

The significance of morbid heredity in the causation of mental deficiency has undergone a change in the last decade. The terms morbid heredity and neuropathic taints are very elastic. These factors alone are not enough to account for the great number of mental defectives. It is a serious question whether the so-called neuropathic taints are not found as often in the families of those considered as normal. Our records show that most of the families had no such taints. Only a few of the feeble-minded children had feeble-minded parents. Dr. Myerson stated lately, at a meeting in Boston, that of the feeble-minded who had left Dr. Fernald's institution and had married, few had feeble-minded children. There are undoubtedly instances of direct heredity and familial occurrence of mental deficiency but these may be considered as museum cases. Criticism of such works as "The Jukes" and "The Kallikak Family" has been made by reliable investigators.

The majority of the parents used little alcohol, many were total abstainers. The observations in the clinic do not lead one to believe that alcohol is an important factor in the causation of mental deficiency. The deleterious action of alcohol on the off-spring in the lower species has been observed on laboratory investigation. The applicability of the same influence in the human is still a question.

In general, lues is accredited with playing a small part in the causation of mental deficiency.

The solution of the etiology of mental deficiency rests with many departments of investigation, but it appears that one can expect great aid from the neuropathologist. It would appear that neuropathological studies of brains selected according to the classification described, with comparison of findings and elimination of secondary changes would throw further light on the anatomicopathologic basis of mental deficiency.

The question of institutionalization or colonization enters into the problem of mental deficiency as a solution to a better adjustment to environment. Little can be done at home for the idiot and imbecile except to accustom him to an orderly vegetative existence. At the institution, the imbecile may be afforded some opportunity to utilize his energy. Many of the higher grade morons and borderline are tractable and easy going. They can be taught to do simple work and even earn a steady salary. It seems however that the complicated life of the city with its crowded quarters is a poor environment for

many of this group. Noxious influences bringing about the formation of bad habits early in life renders them unsuitable for a peaceful social existence. If placed for training early in life, the possibilities of adjustment to extramural are better.

An interesting observation is that many of the higher grade morons and borderline boys who frequently run away from home are found to be participants in homosexual acts often for lucrative purposes. The histories indicate that they were first forced into this type of behavior by guile or fear.

The importance of environmental adjustment need not be stressed as being especially applicable in the conduct disorder cases. These patients often present a picture closely resembling mental deficiency. A study of the habits and emotional reactions of these individuals aids in the differential diagnosis.

The postencephalic conduct disorders in children present a unique problem. The patients are restless, impulsive and show an apparent lack of attention. Some of the younger patients act like hypomniacs. Their school work is poor because of the behavior and physical disabilities. Except in few cases, they cannot be regarded as feeble-minded in the technical sense. It is evident that special institutions are needed for the care and study of these cases.

SPECIAL REPORT
CONVALESCENT CARE OF NEUROLOGICAL PATIENTS
REPORT OF SUB-COMMITTEE OF PUBLIC HEALTH COMMITTEE
OF THE NEW YORK ACADEMY OF MEDICINE

The problem of convalescence in patients suffering from neurological disease is different from that encountered in other disease groups. This is chiefly because so small a percentage of neurological conditions runs a clear-cut course eventuating in cure without residuals of one or another degree. The close merging of sub-acute and chronic in the neurological field renders it impossible to make a plan which is strictly concerned with convalescence. This report, then, has been permitted to become a recommendation for the care of neurological patients of all varieties except the truly acute. In neurology the problem is less of convalescence than of the care of the post-acute period. The large proportion among neurologic sick of indeterminate sub-acute or, better, sub-chronic cases, makes difficult the estimation of the number of cases requiring convalescent care. Actually it would seem that the number for such care rests not only on conditions *per se* among the patients, but on the kinds of places yet to be made ready to accept them. The sub-committee upon neurological convalescent care finds it preferable therefore to let its discussion of the numerical needs of the situation follow and not precede its descriptions of the facilities to be developed.

The sub-committee presents, first, a plan relating to desirable plants for the care of post-acute cases, such being several in number and so conceived as to bridge the full gamut of presumable convalescent and chronic patient needs. It formulates, secondly, a series of certain elementary principles, chiefly relating to the allotment of patients to a convalescent system. It presents, then, lastly, an estimate relating to the numerical needs.

The following is a tentative outline of the several types of convalescent homes which might be made to share in the care of neurological cases. At one end is the general convalescent home; at the other, the chronic hospital; and, in between, two types to be described. The general convalescent home of the sort now in existence should have some part in the care of the neurological convalescent cases. This type should be divided into two sub-types, on a basis of size of plant and bed capacity. Both sub-types would be designed to assist in the convalescent neurologic case, although neither would be expected to devote but a small proportion of their beds to that purpose.

The general convalescent home, sub-type A,* is of small bed capacity; no resident physician is required, and no emphasis on neuro-

* See Epitome.

logical nursing. This sub-type corresponds to the present existing small convalescent home for general medical and surgical cases, and represents no innovation. It is recommended that in it certain organic neurologic cases, in small ratio, should also be cared for. Certain peripheral neuritis cases, mild poliomyelitic ones, and cases of successful brain or spinal surgery would indicate the kind of convalescent case eligible in such a setting.

Sub-type B, of the general convalescent home, is also no innovation, inasmuch as the present existing Burke Foundation is the prototype. It has large bed capacity, 275 or more. This warrants and makes necessary a resident physician. Emphasis on the neurological training of a part of the nursing staff is required. Such a large sized general convalescent home should accommodate general medical and surgical cases, a small ratio of organic neurologic cases—such as were mentioned for sub-type A—and, in addition, a small ratio (estimated 5 or 6 per cent) of functional neurologic cases, such as psycho-neuroses. It is to be noted that these functions are just those which the Burke Foundation now covers.

The second large type would be the specialized neurologic convalescent house. Such a plant is not now in existence. Preference should be for a large plant rather than a small one, but a resident physician should be maintained if the institution is of a considerable size. In any event, it would be well to give much responsibility to neurologically trained nurses. The following incomplete list indicates the types of cases to be cared for: Convalescent choreas, early cases of amyotrophies, certain neuritic and post-encephalitic cases, early Parkinsonian cases, certain incipient remitting multiple sclerosis ones, certain poliomyelitic, certain early although already treated neuro-syphilitic ones, residual vascular cases, certain post-operative brain or spinal cord cases, and mild endocrinopathies. It would be desirable to have a few convalescent general medical patients as a possible leavening of the morale. It would not be desirable to use such a plant at all for functional neurologic cases. In this type of home, recreations and games would be provided, and also occupation therapy. Medicinal therapy should not be banned, but should be minimized on the basis of its antagonism to psychic convalescence, even in organic cases. Little or no aid from the patient would be expected in connection with either the domestic or farm work of the institution.

The third large type is interposed to complete the schema before we arrive at the fourth, which is the chronic hospital. The third is the neurological convalescent farm, and this is also divided into two sub-types. Sub-type A approximates in intention what is being accomplished at the Gould Farm. It is conceived as a large plant environed on a large workable farm. A resident physician is desirable and neurological training for the nurses. This sub-type A would be almost exclusively for the functional type of case, including all the psycho-neuroses, the endocrinopathic cases with psycho-neurotic symptoms, and even a small part of the constitutionally inferior who lack episodes. But a certain portion of the bed space could be given to organic cases, namely, choreas, neuritides, mye-

litides, and even quiescent neuro-syphilitic cases. Recreations and games would be provided, but not occupation therapy. Instead, emphasis would be placed on more practical occupational endeavors, namely, household, farm and garden work, and animal husbandry.

The sub-type B, of type III, is not represented, as far as is known, by any existing plant. It would be a convalescent farm for behavior children, including post-encephalitic children. It would require a resident physician, although the bed capacity in itself might not warrant this. Nurses in it should have neurological training. The regime would approximate that of the neurological convalescent farm, conditioned by the age and defects of the problem children. It is probable that it would prove feasible to use the convalescent farm for children, also for the convalescent normal boys of the ages twelve and a half to sixteen, who are now very difficult to place.

The fourth type of institution to be considered is the chronic hospital. Though it is not a part of the convalescent system, it would continually function in correlation with such a system. The experience of Montefiore Hospital should be a partial guide in the development of new hospitals for the care of chronic neurologic cases, particularly in the retention of a portion of the bed space for cases which are admitted for medical study and diagnosis, in contrast to the larger number which requires practically only custodial care. In Montefiori Hospital 19 per cent of the patients are listed as admitted for study and diagnosis, 43 per cent are the kind requiring only custodial care, and 38 per cent of a kind requiring special nursing care. In chronic hospitals yet to be developed somewhat less than 19 per cent of patients for study and diagnosis would be useful to improve the atmosphere of the institution. The chronic hospital should have a large bed capacity, and should have a complete hospital organization with a staff of resident physicians. Medicinal therapy should be continued, and physiotherapeutic treatment should be stressed. Practical work by the patients in the running of the institution should be only occasional and incidental, and their recreations should be supplemented by occupation therapy.

In résumé, it is seen that the following cleavage of clinical cases would occur: Functional cases would be provided convalescent care, chiefly on the neurological convalescent farm (type III, sub-type A), though a small percentage of such cases are planned for in the general convalescent home as well (type I, sub-type B). The behavior child would be provided for in a sub-type of the neurological convalescent farm (type III, sub-type B). The organic cases would be chiefly directed to the specialized neurological convalescent home (type II), but also in small number would be cared for in the general convalescent home (type I, sub-types A and B) and on the neurological convalescent farm. It is considered that the only place in the convalescent system for the epileptic case is the specialized epileptic neurological convalescent home, where such cases, in small number and proportion, could be taken. Apart from that, the chronic hospital, preferably a hospital restricted to epileptic cases, would have to be used for these patients.

In presenting the points involved, the first principle is that in

neurology the need of convalescent care is not confined to acute cases. Sub-acute cases running a prolonged clinical course are, in the remissive stages and in rest periods, also in need of the facilities which a convalescent system offers. Even such chronic progressive diseases as the amyotrophies will, in the earlier stages, need the convalescent environment, as they are gathering courage for new conditions and are making ready for a fresh effort on the only possible level of activity.

Secondly, the development of facilities for the care of convalescent cases should be separate from the development of facilities for chronic cases. This duality should be sought even though a partial exception is made in the recommendation that the chronic hospital should use a small percentage of its beds for the study and diagnosis of patients.

Thirdly, the assignment of patients in the convalescent system should not rest on an arbitrary disease classification but should depend on the status of the individual patient.

Fourthly, the institutions which might eventuate along the lines of this plan would be brought to a measure of coöperation. This should be done through the organization of a central bureau, to have a guiding hand in the placing of the patients needing convalescent care. Centralization of complete control would rest on a denial to the convalescent institutions of power over their admissions, and it is unlikely that that would prove practical. The solution would seem to lie in the creation of a central information bureau, which would tabulate each day the facts concerning the number and location of all available convalescent beds. This function in turn would be supplemented by the central bureau furnishing office space for periodic visits of the admission officers of the various convalescent institutions. Such a plan should save the patient needless inconvenience, and at the same time preserve the full authority of the various convalescent institutions. The cost of maintaining such a bureau should be assessed partly against the hospitals and clinics furnishing the patients, and partly against the convalescent homes; the former because they would be receiving daily information regarding convalescent facilities, and the latter because through it they could keep control over admissions.

The estimation of the number per year of possible convalescent patients is at best speculative. It is obvious that two sources need to be dealt with: First, the neurological ward services of all New York; secondly, the out-patient neurological clinics of New York.

The Hospital Information Bureau has helped to assemble data regarding the number of neurological patients receiving ward care each year in the hospitals of New York. That figure is approximately 2,700 patients each year. Of this number 2,175 are taken care of by only four hospitals—the Neurological Institute, the Mount Sinai Hospital, the Bellevue Hospital, and the Montefiore Hospital. The difference between the number 2,170 and the total number is 525, and this represents the estimated number of neurological cases cared for each year in hospitals which do not maintain separate neurological services. It is difficult to say what percentage of this material needs convalescent care, but it is thought that approximately 70 per cent*

does. It is therefore estimated that from ward material 1,900 convalescent patients would be derived each year.

The Committee on Dispensary Development has aided us regarding the out-patient figures. They consider that the number of new patients per year in the neuro-psychiatric clinics is between 15,000 and 20,000. It is hazardous to say what percentage of this ambulatory material should be given convalescent care. A review of 200 Cornell clinic cases by a trained psychiatric social worker indicated that 30 per cent of the neurological patients needed this care. Estimations from other sources have been as low as 5 to 10 per cent. This present report would submit that 20 per cent offers a working basis and should prove fairly accurate on trial. Putting down 20 per cent of 20,000, we find that 4,000 patients a year would be derived from out-patient clinics. The two sources combined would furnish approximately 5,900 patients per year for convalescent care. If the average convalescent period were six weeks, a bed capacity of about 700 would be required. This is a minimum. It is based on the working of the present system, in which convalescent care is not easily procured (the Burke Foundation limits the neuro-psychiatric census to 5 or 6 per cent of their whole enrollment, and refused about fifty applications per month for such patients). If a comprehensive convalescent system were brought into existence, it is certain that greater numbers would soon be asking its benefits. There would be a certain increase in the needs. The present committee can risk no speculation regarding that ultimate demand. Five thousand nine hundred prospective patients per year represents the closest present day estimation, and must serve to conclude this report.

EPITOME OF REPORT

I	II	III	IV
General Conva- lescent Home	Specialized Neu- rological Con- valescent House	Neurological Con- valescent Farm	Chronic Hospital
1. Sub-type "A," small bed ca- pacity	(for organic cases)	1. Sub-type "A" (chiefly for functional cases)	
2. Sub-type "B," large bed ca- pacity		2. Sub-type "B" (for behavior children)	

Respectfully submitted.

FREDERICK TILNEY, M.D., *Chairman.*

THOMAS K. DAVIS, M.D., *Secretary.*

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PHILIP S. GOODHART, M.D.

EMANUEL D. FRIEDMAN, M.D.

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HENRY A. RILEY, M.D.

ISRAEL STRAUSS, M.D.

WALTER TIMME, M.D.

EDWIN G. ZABRISKIE, M.D.

SOCIETY PROCEEDINGS

NEW YORK NEUROLOGICAL SOCIETY

THE FOUR HUNDRED AND TWENTIETH REGULAR MEETING, APRIL 7,
1925, THE PRESIDENT, DR. I. ABRAHAMSON, PRESIDING

I. PRESENTATION OF PATHOLOGICAL SPECIMENS

1. ANEURISM OF THE RIGHT POSTERIOR COMMUNICATING ARTERY OF THE CIRCLE OF WILLIS PRODUCING THE SYNDROME OF ALTERNATING OCULOMOTOR HEMIPLEGIA
2. ANGIOMA AND ENDOTHELIOMA IN ONE FRONTAL LOBE.

DR. IRVING J. SANDS

Case 1. Woman, thirty-four, admitted November 25; died December 4. White, native born, married, common school education. Negative family and personal history. Four healthy living children; no miscarriages; good habits; never ailed before. Present illness began November 7, when she complained of seeing double and was unable to raise her right eyelid. Also complained of headaches and a weakness in the back and lower extremities. She consulted several private physicians, and visited the Clinic of the New York Eye and Ear Infirmary. Her teeth were all removed November 18. November 25 she went to bed as usual, and with her usual complaint of headache and weakness. At 10 P.M. her husband noticed that she was very restless; she tossed about in bed, moaned a great deal, and her breathing was labored. He could not waken her, and she became stuporous. An ambulance took her to the hospital.

On admission patient appeared to be well developed and well nourished; but she was comatose. Her skin was cold and clammy; pulse, 100, of good quality; respiration, 20 to 24; temperature, 97.4° F. Left facial paralysis; mouth drawn to the right. Right eyeball ptosed. Right corneal reflex absent. Right eyeball turned to the right; right pupil dilated and did not react to light. Left eyelid normal. Left eyeball moved normally. Left pupil smaller than the right, normal in size, and reacted well. Left corneal reflex present. Neck soft. Left extremities paralyzed. Right extremities normal. Left biceps, triceps, knee jerk, and ankle jerk, were exaggerated (+++++). Right deep reflexes were normal (++). Left abdominals absent. Left Babinski, Oppenheim, Chaddock, and left ankle clonus. Left side of chest failed to expand with inspiration. Heart and lungs were negative.

On November 26 her general condition remained unchanged. Paralysis of the left face and left extremities, with left pyramidal

tract signs; right eyelid ptosed; right eyeball turned to the right. Blood Wassermann and blood chemistry, normal. Urine showed a trace of albumin. Blood count was normal. On November 27 her condition improved. A lumbar puncture was then done and 12 c.c. of bloody fluid was obtained under +++ pressure. The Wassermann of the spinal fluid was negative, but it was unsatisfactory for examination for the other tests. She seemed brighter, and on the 28th of November she was able to answer questions quite well. There was, however, a complete paralysis of the right oculomotor nerve. Eye grounds showed moderately advanced arteriosclerosis. She had left facial weakness; tongue deviated to the right. There was weakness of the left side of the body; but no Kernig, Babinski, Oppenheim, or ankle clonus.

On December 2 she suddenly became comatose, neck became rigid, but reflexes on that day were normal. A lumbar puncture was performed and fluid was again bloody. Her condition became worse. The rigidity of her neck was increased. She showed bilateral Kernig. No pyramidal tract signs. On December 4 she showed definite dullness and râles on the left side of her chest, with prolonged expiration, and died.

Post-mortem examination showed left lobar pneumonia, congestion of right lung, spleen and liver. On opening the dura, there was definite free blood in the right side. On removing the brain there was a definite aneurysm of the right posterior communicating artery of the circle of Willis, which had apparently ruptured on two occasions. The right oculomotor was somewhat thinner than the left, of a yellow color, and was pressed upon by the aneurysm.

Case 2. Woman, white, forty-three, married, was in fair health until January 1 when she had a severe epistaxis; remained in bed two weeks. Then she was up and about, but complained of severe headaches and insomnia. The headaches were constant day and night and were not relieved by any medication or counter irritation. At 9 P.M. of February 26, patient had a convulsion in which her whole body became stiff, her face blue, and she foamed at the mouth. She regained consciousness, but at 3 A.M. she had a similar attack, and convulsions continued every twenty to thirty minutes.

She was admitted to the hospital at 7:45 A.M. on February 27. She was well nourished and well developed. She was unconscious. Respirations were regular but noisy. Skin cyanosed. There was no cervical rigidity; no Kernig; and no pathological reflexes were elicited. Pupils were equal and regular between attacks. Knee jerks were bilaterally present. Heart and lungs were apparently negative, except for a few râles with diminished breath sounds. Lumbar puncture resulted in 10 c.c. of clear fluid being obtained with a +++ pressure; there were 30 lymphocytes; globulin negative; Fehling, reduced; colloidal gold curve showed no reduction. Urine was negative; blood count, normal. Blood Wassermann was negative. Patient continued to have convulsions and she died during a seizure at 4:45.

Complete postmortem examination was done. It showed the following: Chronic fibroid phthisis; fibrosis uteri; congestion of liver, spleen and kidneys; angioma and endothelioma of right frontal lobe.

On removal of the brain, it appeared to be of normal size and appearance. The convolutions were of normal size, and the sulci of normal depth. The dura was adherent to the right frontal pole. The right frontal lobe felt denser than the rest of the brain tissue. On sagittal section there were two tumors which on both gross and microscopic appearance gave the typical picture of endothelioma in the upper one, and of angioma in the lower tumor.

Discussion: Dr. I. Abrahamson said: Of special interest in this case of aneurism with two successive hemorrhages is the fact that in spite of the bleeding in the first apoplexy, there were very few irritative symptoms at the base of the brain. In the second attack, there were definite retraction of the head and a marked Kernig present. What interested me is that this patient presented at first a diplopia and a ptosis of the right eyelid, and then a right internus weakness, and headaches and restlessness. Then she developed a hemiplegia affecting the lower left face, the tongue, and the whole of the left side of the body. Usually in a hemorrhagic hemiplegia there is dilatation of the pupil on the side opposite the lesion, and here there was a dilatation of the pupil owing to involvement of the third nerve on the same side, and if anything a smaller pupil on the left side. The pulse was 100; there was no evidence of any swelling of the brain or intracranial irritation to slow the pulse. In the second attack, the picture was the typical picture we have seen in the hospital of bleeding into the meninges. This picture of bleeding is a very characteristic one, and I think that without a lumbar puncture one ought to be able to make the diagnosis. These cases have an acute onset, a typical apoplectic onset, but with rigidity of the neck and a Kernig, with loss of consciousness and signs of motor irritation. The patients are restless and stuporous. I have seen these cases quite a few times and once seen and recognized they offer little difficulty in the future. During the first attack the patient did not present this syndrome; but in the second attack this was very obvious. Most likely the hemorrhage was confined in the first episode; free in the second.

The second case is very unusual. The epistaxis might have given a clue to the angioma. This may have been an individual with multiple angiomata, one of which was in the nose, and which gave a tendency toward epistaxis. This might have given rise to the suspicion that there was an angioma of the brain.

Dr. E. D. Friedman said: I think this is a subject worth talking about *in extenso* because, as a result of the recent paper by Symonds, one can achieve a certain amount of certainty in the diagnosis of some of these cases. They were first described by Gull, later on by Beadle, Fearnside and Wichern, and more recently Symonds has been consistently drawing attention to these cases of perforating aneurisms, largely at the base of the brain. In a great many cases the picture is exactly as Dr. Abrahamson has put it. The patient

suddenly experiences a sharp pain at the base of the skull, promptly goes into coma, exhibits a positive Kernig, some rigidity of the neck, and a certain amount of fever; a diagnosis of infectious meningitis is often made; but the lumbar puncture shows uniformly bloody fluid, which is a characteristic thing. The fact that the fluid is not bloody from trauma can be readily ascertained if you use a number of test tubes, for the fluid is uniformly bloody in all of them, the blood does not coagulate spontaneously if you allow the test tube to stand; the supernatant fluid shows a distinct discoloration, varying from pink to brown. By contrast, fluid which is bloody from trauma of the veins at the time of the puncture is not uniformly bloody, the first tube containing most of the blood and the succeeding tubes containing less and less; the blood coagulates spontaneously, and if left to stand in the test tube the upper layer of the fluid is clear and colorless. The type of fluid described, in conjunction with the clinical picture, makes the diagnosis of subarachnoid hemorrhage very likely. Symonds has described an additional symptom which helped me in a case we recently saw at Bellevue. We made the clinical diagnosis on the acute vascular episode associated with bloody fluid of this type, and with the appearance of punctate hemorrhages in the retina. On the presence of this syndrome, the clinical diagnosis of perforating aneurism was made, and later confirmed by autopsy. Symonds reports a number of cases, in many of which he made the clinical diagnosis correctly. I recently observed another patient, in whom we postulated such a lesion. The patient presented a syndrome of Weber, and resembled very much the case presented by Dr. Sands this evening. The patient, a lady of fifty, with a history of hypertension, was in the kitchen of her home one afternoon; she suddenly experienced a sharp pain at the back of her head, promptly collapsed, and became stuporous. When seen by me about two days later, she presented an alternating hemiplegia with right sided third nerve signs and left sided paralysis. The spinal fluid was of the type described above. On the evidence, a diagnosis of a ruptured military aneurism at the base of the brain with bleeding into the subarachnoid space, was made. She came out of the stupor and did fairly well for a number of weeks, but then her symptoms recurred. A subsequent puncture revealed xanthochromic fluid and a moderate pleocytosis (lymphocytes). The patient died during the second attack. No autopsy was performed; but the clinical history is highly suggestive of perforating aneurism at the base of the brain. The fact that the patient may go through several episodes is quite characteristic of the disease. This depends on the size of the perforation in the vessel wall. If you have slight oozing, the patient may recover from the first attack and will not succumb until the second or third rent occurs. Was the fundus normal.

Dr. Sands said: Yes, it showed nothing.

Dr. Friedman said: In a number of cases it is not. If the bloody fluid is under tension, it may find its way into the sheath of the optic nerve, and appear in the guise of hemorrhages in the retina. In

regard to the etiology of these cases, one may say that they occur most commonly in hypertensive cases with arteriosclerosis and resulting weakness of the vessel wall, with the production of miliary aneurisms; in infectious endocarditis with mycotic aneurisms and dilatation; and in many cases in relatively young persons with congenital aneurisms, particularly in those who are the subject of status lymphaticus.

Dr. Abrahamson said: Recently attention was called to the so-called "flame-like" hemorrhages in the retina occurring in cerebral and especially in extramedullary hemorrhages.

The second case is unique. I wish to call attention to the fact that at the Montefiore Hospital it is not uncommon to see a tubercular patient die of tuberculosis and present a large glioma without apparently a single sign or symptom referable to it during life. This is a similar case, with practically no signs, the late signs being probably due to the angioma rather than to the endothelioma at the cortex. Recently we found a very large tumor in a patient with myotonia atrophica. I should like to ask Dr. Sands how he explains the presence of the 30 lymphocytes in the spinal fluid in the early days of the disease.

Dr. Sands (closing): I am grateful to Dr. Friedman for his comments. The literature is full of case reports of intracranial aneurisms, and we all should be more familiar with the syndromes that they may produce. The vast majority of men who have studied the subject feel that a diagnosis is not possible. Such was the opinion of Gull in 1859, and of Beadles in 1907. The latter, after his analysis of 555 autopsy specimens, concluded that not only was it impossible to diagnose an intracranial aneurism, but in the vast majority of intracranial aneurisms even the presence of tumor could be diagnosed. Symonds, however, seems to have acquired unusual diagnostic skill along this line. In passing through Cushing's wards he selected one patient and insisted that he was suffering from an intracranial aneurism. The diagnosis was confirmed at autopsy. Cushing was so impressed with such diagnostic skill that he personally went through his records and wrote a paper on them which was published in the April, 1923, number of *Guy's Hospital Reports*. My case occurred during the epidemic of encephalitis, and we thought we were dealing with such a case. The shifting of symptoms was explained on the condition of the edema of the brain, so frequently found in encephalitis.

The second case is of greater interest to me because of the presence of two different tumors, in one lobe, within a half inch of each other. I know of no other similar case. In reply to Dr. Abrahamson's questions, I would say that the dura was attached to the endothelioma, and that possibly caused irritation and lymphocytic reaction. Then again the convulsions were partly responsible for the pleocytosis. I have seen lymphocytic reactions in epileptic spinal fluids following seizures.

II. SYMPOSIUM. PAPERS BY OFFICERS OF THE NATIONAL COMMITTEE FOR MENTAL HYGIENE

1. THE PROGRAM WORK OF THE COMMITTEE. FRANKWOOD E.
WILLIAMS, M.D., *Medical Director*

CLINICAL PROBLEMS MET WITH IN CHILD GUIDANCE CLINICS

DR. RALPH P. TRUITT (By invitation)
(*Author's Abstract*)

The scientific study and treatment of problem children is a recent development still in the early stages of evolution. Such pioneers in the field as Healy and Glueck and, in the habit field, Thom, gave an impetus to the work, and have been largely instrumental in bringing it to the attention of professional workers in the psychiatric, medical, and social fields.

When psychiatric attention was first turned from the diagnosis of end-results to the constructive possibilities of mental hygiene work with children, we had no doubt an exaggerated notion of the ease and effectiveness with which we would diagnose and treat personality and behavior difficulties in children. However, in exchange for the gross and stubborn manifestations encountered in adult problems, we found ourselves confronted with delicate and often undefined mechanisms in children, demanding a refinement of technique which we are still far from possessing. Into the bargain we discovered in exploring the child's problem, adults in the family who had to be treated if the child were to be adjusted. Moreover, the problem in the case was usually associated with inadequacies in the school system, recreational facilities and the resources of juvenile courts and other social agencies. These social aspects of the problem complicated the picture to such a degree as to change radically our attack. Our realization of all the factors with which we have to deal has determined the successive changes in policy effected in the Division on the Prevention of Delinquency since it was established three years ago as part of the Commonwealth Fund's Five Year Program for the Prevention of Delinquency. The first demonstration was attached to a juvenile court for a few months and was staffed with one psychiatrist, one psychologist, and one psychiatric social worker. This experience with court cases revealed the necessity of broadening our field of action to include less advanced problems recognized by parents, teachers, social workers, etc. The demonstration staffs were increased and now the period of demonstration has been extended to two years. The demonstration itself is conceived as simply a means of introducing the community to the best we have to offer in child guidance methods. As for the cases we handle in the demonstrations, we have little opportunity in the time at our disposal to do more than initiate treatment which the permanent clinic will continue.

The Division has maintained two demonstration child guidance clinic staffs and last year established, as complementary to these, a field consultant service. The personnel of each clinic consists of three psychiatrists, one of whom is the director, two psychologists, six psychiatric social workers, and the necessary clinical force. In addition, the clinic commands the services of local consultants and volunteers.

Each child accepted by the clinic receives a complete social investigation, a thorough medical examination, a full psychological and educational survey, and an intensive psychiatric analysis. The findings are presented and discussed in staff conference and recommendations and treatment in all fields outlined. At frequent intervals treatment conferences are held until the case is adjusted or otherwise closed. Every attempt is made to coordinate the efforts of psychiatrist, psychologist, and social worker, and to avoid an exclusive emphasis on any one phase of the work. As a matter of fact, we have had no cases in which there was not evident a complicated interaction of psychiatric, psychological and social factors.

Mentally defective and psychotic children are not, as a rule, studied, since the function of the clinic is to handle cases admitting of constructive treatment in the community. Children between the ages of three and seventeen whose personality or behavior difficulties constitute a problem in the home, school or community, are accepted. Cases are referred by social agencies, parents, schools, juvenile courts, dispensaries and clinics, in about the order named.

To illustrate the problems brought to a clinic, three cases of conduct disorder were presented. They were not chosen to demonstrate the best or most effective work of a clinic, but they were considered typical of the sort of problem with which we are confronted, the complexity of causation and the difficulties of treatment.

One can see from these cases that we have not formulated any definite therapies. We are not in a position to do so. The work is highly experimental and its progress depends on developments in the allied scientific and social fields. Our gain in insight and technique has been matched by an increased recognition of the complexities of our problems.

COMMUNITY ORGANIZATION IN THE WORK OF A CHILD GUIDANCE CLINIC

DR. LAWSON G. LOWREY, OF CLEVELAND

(Author's Abstract)

There are two main aspects of community organization in the work of a child guidance clinic: (1) that designed to integrate the clinic as a whole into the organized work of a community (educational-administrative organization), and (2) organization and focusing of community resources in relation to the needs of the individual patient (clinical organization).

The first aspect presents many angles—education of all groups

who may have need of clinic services, development of coöperation and interchange of experience between the various groups, demonstration of needs, etc. Many of these depend for their major effect upon the adequacy of work from the second aspect, though the two are mutually interdependent.

The second aspect has specific relationship to the problems involved in the treatment of the maladjustments which express themselves in the disturbing behavior. The general principle is that disorders of reaction are related to discrepancies between the capacities of the individual to react, and the situations to which reaction must be made. Disorders of capacity are to be met, if possible, by some form of direct attack on the problem. In all situations where no direct attack seems feasible and even where such direct treatment is possible and adequate, there is always much to be done by indirect methods, or manipulation of environment. It is here that community organization becomes of the greatest importance. Dealing with a single case may involve medical treatment, psychotherapy, family relief, family reconstruction, recreation, change in school placement, education of parents for that profession, employment, legal measures, etc. Facilities for social manipulation may be lacking in the part of the community where needed. It is the clinic's function to try to correlate all activities relating to children. Much valuable advice may be had from many sources. Frequently consultations of many organizations are necessary—as in one case where fourteen different agencies—health, recreational, religious, school and social, took part in planning to meet certain definite needs of the situation.

The clinic cannot, in and of itself, do all the work needed in the treatment of behavior disorders. But it must get the work done, and must do this through coöperating agencies. Hence its vital need for effective community organization.

Discussion: Dr. Bernard Glueck said: After this exhaustive and very interesting presentation of the subject matter, there is really very little comment left to be made, except the comment of commendation. To the physician whose chief activities are confined to office practice, this aspect of the social and public implications of psychiatry as it was presented to us this evening must indeed be very encouraging, because we must all recognize that unless we develop a community conscience and a community machinery for dealing with these problems, the individual effort of the psychiatrist and the physician will never bring us anywhere near a solution, or even adequate amelioration of the serious and important problems of human maladjustment.

Dr. Williams' paper was very illuminating in showing what the National Committee for Mental Hygiene has been able to achieve during the few years of its existence, and it also indicates many future possibilities for constructive and useful work. I was particularly interested in the statistics of psychopathological conditions in prisons, jails, etc. Instead of diminishing, the incidence of these conditions seems to be on the increase. I think that is a very clear and encouraging indication of the effectiveness of the various social

enterprises that have been developing in the last decade or so. It should be expected that as these extramural social enterprises develop and become more efficient in their work that those individuals who have the capacity to respond to these enterprises will respond to them, and that eventually the institutions, jails, prisons, homes for chronically dependent cases, will house more and more those individuals who are not responsible or capable of responding to such treatment as the community provides for the maladjusted individual, and eventually all these socially pathological institutions, the institutions which have been developed to deal with problems of social pathology, will be found to be largely, if not entirely, institutions housing problems of medical or psychopathology. But these figures, as pointed out by Dr. Williams, reveal to us merely a static presentation of the problem. It is an attempt to classify in some way the end-products of maladjustment, and to those of us who have been at work in this field it has always been extremely unsatisfactory that we have not been able in these surveys of large groups to get anywhere near the dynamic situations involved in these problems. We know that we are dealing with the end-product. We do not know how they come to be what they are, and we have felt that the discovery of the processes that lead to these end-products and of the means which might modify them is the thing that we are strive for. I believe it was largely because of this need for more knowledge of the conditions which lead to adult maladjustment that the Commonwealth Fund undertook the marvelously extensive and intensive enterprise in the field of the prevention of delinquency. The cases presented by Dr. Truitt show how well, in view of the limited knowledge concerning technique, both of study and treatment, this phase of the work has really been carried on. In connection with the concentration on behavior problems in children, and the developmental phase of these problems, we have come upon a certain few fundamental principles which give promise of considerable constructive possibility. In the first place, we have come to recognize what seems to be a very obvious fact, and should have been recognized from the first, that if we look upon the individual's behavior as a dynamic process, as a series of events following a certain series of causes, that the early years of life must of necessity be the most determining, the most important years of life; and the second general principle, related to that fact, is that the most important conditioning influence in the developmental process is the human environment, particularly the environment of the home. Very soon in this enterprise it was discovered that instead of dealing merely with individuals, we have to deal with the settings. The problem is a reflection of a certain setting in which the individual maladjusted child is only one factor of the total situation, and this in turn brings us to see that the physician and the psychiatrist is only one element in this general enterprise, and that social methods and social organization must always play a tremendous rôle in dealing with these issues. Of course the most prominent feature of all this work lies in the direction of prevention. If we are justified in looking forward to the discovery as a result of

these studies of certain fundamental principles of child guidance, and if we can translate these principles into the kind of language that will make possible for these same organized enterprises to contribute something to the training of parents and teachers, these efforts will be well repaid. I think the work of Thom in the habit clinics and the child guidance clinics, of which we have heard this evening, are furnishing a growing amount of dependable knowledge that can be turned over to parents and to institutions for training of teachers, and thus prevention might be stimulated.

I want to say a word or two in respect to the constitutional psychopath. Undoubtedly we have in the past exaggerated the factor of constitutional or native handicap as a determining influence in these maladjustments. At the same time, I think it would be just as fallacious to swing too far in the opposite direction. If we cannot speak of clear-cut constitutional anomalies, we can at least speak of a constitutional degree of vulnerability, because in the last analysis infinitely more children are exposed to the same influences than eventually develop maladjustments of one sort or another, and one of the features of this situation is the native degree of resistance, or the native degree of vulnerability that the child brings into the situation. I believe it will be extremely economical and worth-while to direct our attention more seriously to this aspect of native equipment beyond the physical and purely intellectual and will lead us to a better understanding of these native handicaps. I am sure that all of us are deeply grateful to Dr. Williams for bringing this interesting and instructive program before us this evening.

Dr. C. P. Oberndorf said: The work of the National Committee for Mental Hygiene has acted as a stimulant and inspiration and furnishes a standard of scientific excellence to be approached by the various committees throughout the country in dealing with the problems of mental disease. Their work extends into fields where there has been much less interest in mental problems than in metropolitan areas, and their endeavor to encourage improvement in local institutions by actual demonstration has been an undertaking which it is difficult indeed to overestimate. Anyone engaged in the problem of mental hygiene is impressed with the very marked influence of a disease in one member of the family upon the life of every other member of that particular family, so that for the happiness and peace of the ordinary home, the relief of the individual from the symptoms which threaten the disruption of familial groups, becomes absolutely necessary.

One of the points which it seems to me that the National Committee has neglected in their broad program is the education of the physician, who is so often the first person consulted by the patient or a relative, when mental peculiarities begin to manifest themselves. It is surprising to find how very limited indeed is the knowledge of the average physician of the problem of mental hygiene, and apparently from their report this evening, the National Committee has not given great consideration to the possibility of the general hospital as a nucleus for the education of physicians. Dr. Truitt's case, where

the diagnosis was hysteria, and where three or four different diagnoses had been made by physicians, indicates how frequently the mental side, the conversion of mental conflict into somatic symptoms, is overlooked by the physician.

Dr. Glueck has emphasized the environmental relationships as being fundamental, and curiously enough, at the same time, has attributed equal weight to the dynamic factors. It is startling to see how two or three children of the same physical appearance, of the same family and environment, show such very marked differences in their psychic reactions, and how one child later develops a neurosis or a psychosis, and the others continue normal. There is apparently something more than the environment, or even identical parentage, which is responsible for such a condition. In an investigation of neurotic or functional psychotic conditions, it seems to me that the approach of the individual in an attempt to find out the dynamic factors in his life's history, is really of greater importance than the regulation of the environment. If regulation of the environment were the solution, it would be best to place deviating children in institutions, but we know that institutional environment is seldom wholesome. The best solution available for conduct disorder seems to lie in the recognition of the conscious and unconscious emotional factors controlling the person, far more than the intellectual capacity, and in painstaking investigation, such as Dr. Truitt has presented this evening, for maladjusted or potentially psychotic persons.

Dr. Philip R. Lehrman said: Dr. Lowrey has aroused interest in a problem more or less personal, in the psychiatric clinic problem in this city. Very recently one of our large institutions, to save expense, disposed of the psychiatric social worker. So that while progress is being made elsewhere, regression occurs in our midst, and my jealousy is aroused towards the outposts of Cleveland and other places far from here which have the benefit of the excellent work of the Committee for Mental Hygiene.

Dr. Truitt (closing) said: I would like to say a word in reply to the question about educating local physicians in this work. In one of our demonstration groups last year, there were twenty-four medical men who volunteered to examine children at the clinic. All of them gave at least a half day a week for a few months and some served the clinic throughout the year's demonstration. They were pediatricians, psychiatrists, neurologists, and other individual specialists. In a city of about a million population this number represents perhaps as fair a proportion interested in studying behavior problems in children as would be found in other phases of post-graduate work. Practically all of the routine physical examinations and many of the psychiatric studies were made by the volunteers in coöperation with a member of the clinic staff. They often attended staff and treatment conferences on the cases they had examined. We feel that some of them profited medically by this experience, and in addition received some insight into the social and educational problems presented by the children. There were also volunteer psychologists and social workers working in the clinic, some of them full time during the

entire year. Lectures or addresses were given by the clinic staff to medical societies, medical students, nurses, classes in social work and psychology, and a great deal of educational work was done with lay groups.

Dr. Lowrey (closing) said: I have nothing to add. Dr. Glueck said many of the things I should like to have said. I would like to debate with Dr. Glueck the problem of constitutional versus environmental in the production of so-called psychopathic personalities, not that I think I can match him in debating, but I should like to draw out all his ideas on that particular topic.

CURRENT LITERATURE

I. VEGETATIVE NEUROLOGY.

1. VEGETATIVE NERVOUS SYSTEM.

Clerc, A. PERMANENTLY HIGH BLOOD PRESSURE. [Bulletin Médical, Vol. XXXVI, No. 31, p. 609.]

This number is entirely devoted to high blood pressure. Clerc concludes his article by saying that our present knowledge of permanently high blood pressure is as vague as ever, only a little less obscure. From the therapeutic standpoint, owing to the complexity of the disturbances, there is no radically effectual treatment. Reducing the intensity of the symptoms, warding off the disturbances they may entail and the danger are the tasks for which the physician must be prepared. The articles that follow show the various means of defense at his disposal to accomplish this.

Bullowa, Jesse G. M. THE "SIXTY-SIX" PULSE. [Med. Clin. of N. Am., November, 1922.]

Bullowa lays emphasis upon the importance of the sixty-six a minute pulse rate as an objective sign of pain. In acute conditions it is a physical sign of vagotonia—either of an overacting vagus or of a deficient sympathetic innervation of the heart. The sixty-six pulse as evidence of vagus tone is an important and often disregarded sign of the severity of irritative abdominal lesions, but the intestinal tract is not the sole source of such vagotonic slowing of the pulse rate, as it may also be produced by spasm of the ureter. It may also occur during the administration of digitalis before nausea or coupled beats appear (ample vagus stimulation) and in stimulation of the sympathetic system by diphtheria toxin in diphtheria.

Barach, J. H. ESSENTIAL VASCULAR HYPERTENSION. [J. A. M. A., Dec. 13, 1922.]

There are three prominent factors in the etiology of most of the cases of essential vascular hypertension: heredity, infection and endocrine disturbance. These factors affect the male and the female differently. In the male, cases of essential hypertension give a history of an inherited tendency, systemic infection, neurocirculatory asthenia and vascular hypertension after middle life. In the female, there is a history of heredity, infection and endocrine disturbances involving the thyroid and

generative system; and there is a tendency to dysthyroidism, sterility and vascular hypertension at the menopause and thereafter. The course and sequelæ of essential vascular hypertension will be determined by the organ inferiority of the individual. The organ inferiority is determined by heredity, previous infection and strain.

Trunecek, C. SPASTIC AND PLETHORIC HIGH BLOOD PRESSURE. [Riforma Medica, Vol. XXXVIII, No. 23, p. 534.]

Two types of cases of high blood pressure are differentiated. The spastic in which the high blood pressure is the result of spasm of blood vessels, and the type for which plethora is responsible. If this does not cure, then the acids in the blood should be neutralized with a harmless alkaline solution. Trunecek's serum is recommended. It is a combination of all the alkalines normally in the blood serum, and in the same proportions. From five to ten injections, each of 2 or 5 c.c. of this, repeated twice a week are generally successful. In older persons with long chronic high pressure of these types, the course must be longer. In prophylaxis, a course of chlorid and bicarbonate mineral waters for two or three weeks, once or twice a year and iodids to promote oxidations may be useful, with Trunecek serum at need.

Kylin, Eskil. THE ADRENALINE REACTION IN CASES OF HIGH BLOOD PRESSURE. [Zentralbl. f. inn. Med., No. 20, May 20, 1922. B. M. J.]

The author refers to his former communications in the same journal (Nos. 22 and 45 of 1921) dealing with variations of blood pressure in acute glomerulo-nephritis and senile diabetes. His observations on the latter condition extended from January, 1920, to September, 1921. He now suggests that the same disturbance of internal secretion underlies both hypertonia and the senile form of diabetes. Since his last communication he has tested the adrenaline reaction in cases of hypertonia (which was present in 75 per cent of all his cases of senile diabetes), using Dresel's technique (Ergebnisse der gesamten Medizin, 1921, Band II). The blood pressures were taken immediately before the subcutaneous injection of 1 mg. adrenaline, and again at intervals of ten minutes for a full period of sixty minutes from the administration of adrenaline. Four charts are given: One is that of a case of acute nephritis whose preliminary blood pressure was 155 mm.; in five minutes the blood pressure rose to 205 mm., falling to 170 mm. at thirty and forty minutes, and to 160 mm. sixty hours after the injection of adrenaline. Chart II is that of a healthy person whose blood pressure rose in five minutes from 160 to 180 mm. and remained at 180 mm. at the end of ten minutes. The pressure then fell regularly to 160 mm. at the end of fifty minutes, and was stationary ten minutes afterwards. The reaction therefore in acute nephritis is similar to that in a normal person, except that the initial rise is much greater and the return to normal less regular. On the other hand, in "benign nephrosclerosis" (Volhard) the initial rise (Curve III)

does not occur, or (Curve IV) is very slight, and is followed by a rapid fall of 20 mm. Kylin states that fourteen observations show that Curve III is more typical, when a fall of 20 mm. occurred in ten minutes, followed by a rise of 15 mm. at the end of twenty minutes. He found that in these cases the pulse rate became usually rather slower, and that no palpitation, tremors, nor nervous disturbance occurred after the injection. He terms this "the paradoxical reaction of benign nephrosclerosis."

Lundie, C. UNUSUAL CAUSE OF DANGER IN PUERPERIUM. [So. Africa Med. Record, Vol. XX, No. 16, p. 311.]

Lundie cites the case of a woman pregnant with her seventh child who was, from the third month, unusually nervous about her coming confinement, fearing she would not survive. The result was that she suffered from severe syncopal attacks during the pregnancy and even for several days after confinement which was accomplished in ten minutes under general anesthesia. The author is convinced that the origin of the syncope was an undue nervous stimulation of the heart.

Allen, F. M. TREATMENT OF ARTERIAL HYPERTENSION. [The Medical Clinics of North America, VI, No. 3, p. 475.]

Based upon an experience of over 200 cases, the statement can safely be made that the great majority of cases of hypertension, whether simple or complicated with other conditions, are more or less completely relieved by the single measure of salt-free diet, carried out thoroughly and accurately for a sufficient length of time. The results, Allen claims, are not due to chance, psychic influence, rest, reduction of weight, or other imagined agencies. It is a scientific fact that a relation exists between chlorids and vascular hypertension. If the blood pressure cannot be controlled by a salt-free diet, the prognosis is bad. Patients of the refractory group generally die within a year from some one of well-known accidents of hypertension. In two of the three cases reported, the hypertension with its concurrent symptoms was greatly alleviated by the salt-free diet. No medicines or other artificial measures were employed. The patients were allowed to walk and exert themselves at will. The diet was unrestricted except for careful exclusion of sodium chlorid. Abundant protein and calories were thus taken, and no weight was lost. The prevalent idea that a salt-free diet cannot be made appetizing is entirely erroneous.

Buchanan, J. A. PHENOMENA OF RAYNAUD'S DISEASE. [Am. Journal of Med. Sciences, Vol. CLXIV, No. 1, p. 14, J. A. M. A.]

The histories of sixty-seven patients observed in the Mayo clinic were studied by Buchanan; fifty of these were traced. The incidence of Raynaud's disease in relation to the total registrations of patients in the clinic each year varied from 0.012 to 0.026 per cent. It was not demonstrated that physical and nervous strain incident to any one type

of occupation or social stratum was a cause of the condition. The duration of the disease was up to forty-five years. Sixty patients described the mode of onset as very sudden. There was nothing in the histories of the patients to indicate that the disturbances depended on a toxic process. Local hyperemia, with the other vasomotor phenomena of Raynaud's disease, was found in eight patients. The lesions were bilateral and symmetric in thirty-eight patients and asymmetric in twenty-nine. The systolic blood pressure was within normal limits in forty-nine patients, above normal in eleven and below normal in seven. The diastolic blood pressure was within normal limits in fourteen patients, above normal in thirty-three and below normal in twelve. The absence of a fixity of blood pressure variations in a vasomotor disturbance coincides with the experimental work of Krogh. The examination of the urine was negative in all cases. Hemoglobinuria was not observed in any case. The basic mechanism involved in the production of the symptoms manifested in Raynaud's disease, Buchanan says, remains obscure, but the phenomena observed coincide satisfactorily with the theoretic and experimental possibilities of a disturbance of the vasomotor apparatus. The attacks of syncope are no doubt constrictor, as the part or parts are partially or completely bloodless during the attacks. This is shown by the absence of hemorrhage on pin prick, and further by the total lack of color of the part and the lowered temperature. The asphyxial attacks are probably also constrictor and not dilator, as is commonly believed. The search for a tangible causative factor has been without results. It is not possible to attribute the condition to toxemia, as no possible toxic cause is visible. The infrequency of acute infections in the onset minimizes the importance of the ordinary type of infections as etiologic factors. Heredity plays no part. Whatever may be the casual agent, the method of its action seems in most cases to be peripheral on the vasomotor nerves rather than on the central mechanism, although it is possible that in certain cases both may be affected. Buchanan suggests that the term "Raynaud's disease" should be discarded and "local syncope of Raynaud," or "local asphyxia of Raynaud," or "gangrene of Raynaud" substituted.

Steiner. INFLUENCE OF THYROIDECTOMY ON THE HEART IN GRAVES' DISEASE. [*Schweiz. med. Woch.*, Aug. 31, 1922.]

Steiner has made a study of the heart in eighty cases one year after thyroidectomy, and he has come to the conclusion that the degree of respiratory distress is not, as a rule, proportional to the degree of compression of the trachea. He found some cases in which the trachea had not returned to its normal shape after the thyroidectomy, yet the respiratory disturbances had completely disappeared. It seems that the pressure exerted on the trachea causes respiratory distress independently of the degree of compression of the trachea. Tracheal stenosis had no influence on the hypertrophy of the heart, and, indeed, such hyper-

trophy was comparatively rare in association with marked compression of the trachea. In toxic disease of the thyroid hypertrophy of the heart was twice as common as in cases of goitre exerting a chiefly mechanical action. In about three-quarters of all the cases thyroidectomy was followed by a reduction of the heart to normal dimensions, and this process was most evident in cases of toxic goitre. The results of thyroidectomy were in other respects satisfactory, exophthalmos and tremor having invariably disappeared and nervousness having vanished or become slighter. Subjective heart symptoms and tachycardia had also disappeared or become less, and in most cases adventitious heart sounds had disappeared. The author's verdict is therefore emphatically in favor of thyroidectomy in selected cases.

Klecan, J. C. CASE OF RAYNAUD'S DISEASE RECOVERED. [Endocrinology, VII, No. 1.]

In February, 1921, Klecan's patient began to experience an itching pain in both hands. In June both hands became hyperemic—dark purple. In August, the left third finger broke down and later the right thumb. He came under Klecan's care in September, 1921. Both hands were then markedly hyperemic, the fingers almost black purple. The third left finger and right thumb were necrotic (dry necrosis). No distinct demarcation line was present. The Wassermann test was negative. Later a demarcation line became pronounced. Intense pain persisted. At this time Klecan decided to administer anterior pituitary substance. He gave two grains (0.12 gm.) three times daily. In a few days the pain decreased to such an extent that the patient remained without morphine for days at a time. The patient gained in appetite and craved bread particularly; one-fourth grain (0.015 gm.) of desiccated thyroid was added during the fourth week. All the fingers revived. The right thumb proved to be necrotic only as far as the soft parts were concerned and healed completely during the fifth week in the hospital. Necrosis of the third left finger involved the bone. The patient left the hospital after two months, having gained twenty pounds in weight. He was free from pain. In January, 1922, his condition, with the exception of the third left finger, was perfect. In March, 1922, the third left finger also healed, being shorter by about one-third of the terminal phalanx.

Boas, I. A TRIAD OF SYMPTOMS IN NERVOUS DYSPEPSIA. [Deut. med. Woch., Oct. 20, 1922.]

I. Boas draws attention to a triad of symptoms which are commonly found in nervous dyspepsia. They are (1) a sense of pressure in the abdomen; (2) globus (not the so-called globus hystericus); and (3) nausea. With regard to (1) it is often more or less constant, and it possesses certain well defined characteristics. It is independent of extraneous factors such as the quality and quantity of the food. The

sense of pressure often begins early in the morning, when the stomach is empty, and it usually lasts throughout the day. It is unaccompanied by pain, but as patients are apt to confuse a sense of pressure in the abdomen with actual pain when they are describing their symptoms it is well to interrogate them closely as to whether the sensation is painful or not. With regard to (2) the author distinguishes it from ordinary globus hystericus because his patients showed no other signs of hysteria. Nausea—the third symptom of the triad—is, like (1), independent of extraneous factors such as the quality and quantity of the food. The subjects of this condition are usually women between the ages of thirty and fifty, but men also suffer from it, and the author has found it to be very common in Germany as the result of the extra physical and mental strain thrown on the nation by the war. When other diseases can be eliminated, the treatment for this condition is to discard every dietetic restriction and to encourage the patient to thrust her symptoms into the background. To save her from operative meddling is also an important task. [B. M. J.]

Udaondo, C. Bonorino, and Catalano, Onafre. REFLEX CARDIOSPASM FROM GALLSTONES. [Prensa Médica Argentina, Vol. IX, No. 1, p. 6.]

This clinical report of a male of thirty-six years with two attacks of gallstones in two years. Some time later he had a transient cardiospasm which kept returning. This intermittent and progressive cardiospasm persisted for several months, with other signs of generalized vagotonia. Cholecystectomy was performed after a return of the gallstone colic. The cardiospasm disappeared after this. Other similar cases are discussed.

Latarjet, A. RESECTION OF NERVES OF STOMACH. [Bulletin de l'Académie de Médecine, Vol. LXXXVII, No. 25, p. 681.]

This surgeon's work served to show that the nerves of the stomach of the dog can be partially resected without death to the animal. There is a diminution of the tonus and the force of peristalsis; the amount of hydrochloric acid secreted is also lessened. Seven hours for the evacuation of the stomach contents after the denervation, when two hours sufficed before. On the basis of these data he resected the nerves of the stomach in six cases of tabetic gastric crises; in six of gastric or duodenal ulcers and in ten of stomach disturbances without apparent lesions. He supplemented the denervation with a gastro enterostomy in some of the total twenty-four cases. In the six tabetic cases the pains and vomiting were much improved in two cases; in another patient no effect was apparent; in another there was improvement, but only temporary. The fifth patient was completely cured; there has been no return of gastric crises during the six months since. The cure was complete also in the sixth case; to date both the gastric crises and the morphin addiction are apparently cured. The six gastric ulcer patients all consider them-

selves cured; the denervation had been supplemented with gastro enterostomy. In the ten cases of stomach disturbances without apparent lesions, one woman was cured by the denervation of pains in the stomach and vomiting, after years of suffering. No benefit had followed appendicectomy and fixation of the kidney, but there has been no return of the stomach symptoms since the denervation. The success is equally striking in a man of fifty-three with pains in the stomach for twenty years. In two other cases the condition had not been improved by a gastro enterostomy, but the denervation one and six years later banished the pains. In four others a gastro enterostomy was done at the same time as the nerves were resected, and the cure was prompt and immediate. Another one in this group was cured but soon succumbed to an intercurrent infectious disease. The tenth patient in this group was tuberculous and had intense gastralgia. No benefit was derived from the denervation, nor from a gastro enterostomy later. Only one or two in the total twenty-four patients were mentally abnormal. The nerves of the stomach, he says, are arranged in three pedicles, and he resects each one, as he explains.

Masson, P. PERIGLANDULAR PLEXUS IN APPENDICITIS. [Bulletins de la Société Médicale des Hôpitaux, Vol. XLVI, No. 22, p. 956.]

The author gives a detailed description of the hypertrophied nerve stems and neuromata he has found in connection with chronic appendicitis. These nerve bundles contain cellular bodies not stainable with the ordinary technic, but the ammoniacal solution of silver nitrate method shows them. He discusses the nature of these cells. They seem to be homologous with the Kultschitzky cells of the intestines, and he presents evidence which shows their affinity with the chromaffine cells of the vegetative neuroendocrine system.

Pal, J. GASTROINTESTINAL SPASMS. [Med. Klinik, Vol. XVIII, p. 521.]

Hypertonia, hyperkinesia and permanent contracture are three different mechanisms in the production of intestinal spasm. They must each be met on their own ground. Psychic and reflex causes must be combated, and the stimulus bringing about the hyperkinesia modified. Drugs which deaden pain are merely convenient makeshifts. Spasm may be controlled by checking the action of the nerve innervating the muscle; the parasympathetics are inhibited by atropin. The muscle itself (sympathetic plexus chiefly) can be influenced by papaverin, emetin, camphor or benzyl compounds. The third factor, the sympathetic nerve, might also be acted on; epinephrin may be useful for this, but is not reliable by the mouth, especially with spasm in the lower bowel. Local heat reduces the movements and excitability of the bowel. When from long standing "functional" spasms, permanent contractures result, surgical or mechanical therapy is demanded.

2. ENDOCRINOPATHIES: PARATHYROID, SUPRARENAL.

Sanchez, F. A. HISTOLOGICAL CONSTITUTION OF THE INTERNAL PARATHYROIDS. [Revista de Sanidad Militar, February 1, 1922.]

In this pathological study the author says that while the parathyroid glands proper have received much study, little attention has been given in the past to those found within the thyroid glands themselves. The author received for examination a number of such bodies removed from a man of seventy-three years. They existed in both lobes of the thyroid gland, were of medium hard consistency, grayish in color, and easy to detach from the thyroid stroma. From a study of them Sanchez concludes that, (1) internal parathyroids occur in man and correspond in histological structures to those outside the thyroid body; (2) the connective tissue capsule is thick and gives off from its inner surface partitions with anastomose in the form of a net; (3) the epithelial or secreting element consists of compact groups of cuboid cells and follicular groups of prismatic cells (4) these easily separate into fundamental and chromophile cells; (5) even where the internal parathyroid bodies seem macroscopically separate, the capsule affords only a relative autonomy, and the normal thyroid tissue makes excursions into the interior of the glandule. In general the structure resembles that of other organs of intense secretory activity, the cells containing granules apparently consisting of a phosphorated liquid-like lecithin. Phosphoric acid is one of the substances which take an active part in the formation of lecithin, and is also in close relation to calcium metabolism. Calcium is an ion necessary for nervous activities and has been found in excess by MacCallum in the blood and urine of animals subjected to extirpation of the parathyroids and even in those of men suffering from tetany. From this may be inferred the possible importance of these tiny glands in investigating the pathogeny of such a disease as tetany.

McCarrison, Robert. FUNCTION OF THE ADRENAL GLANDS AND ITS RELATION TO CONCENTRATION OF HYDROGEN IONS. [Brit. Med. J., Jan. 20, 1923, p. 101.]

Dr. McCarrison's conclusions are: (1) The active principle of the adrenal medulla maintains and enhances the sensitivity of, rather than stimulates, the myoneural junctions of the true sympathetic terminals of the enucleated toad's eye, so that their response to the stimulus of light is more sensitive and their sensitivity is longer retained; (2) if this sensitivity is to be sustained and optimum function of the iris to be maintained in media on the acid side of neutrality, the concentration of epinephrin must be proportionate to the concentration of hydrogen ions in the medium; (3) the observations recorded in this paper provide evidence that: (a) The enlargement—with increased epinephrin content—of the adrenal glands in inanition and in avitaminosis may be correlated with the condition of acidosis associated with these states. Its occurrence, for the most part, during the terminal phases of avitaminosis, its

association with marked respiratory disturbances, with oxygen-want, with falling body temperature, and with interference with oxygenation, and its rapid disappearance on the provision of the missing vitamins, suggest that it is an emergency effort on the part of the adrenal glands. (b) The attempted exercise of an emergency function by the adrenal glands may be expected to occur in all conditions of alkalosis or of acidosis.

Hyman, A. ASSOCIATION OF HYPERNEPHROMA, TUBEROSE BRAIN SCLEROSIS AND ADENOMA SEBACEUM. [Journ. of Urol., VIII, No. 4. J. A. M. A.]

Hyman's patient was a boy, aged ten, who had had convulsions since two and one-half years of age. He had been mentally deficient since early childhood, so much so that his parents were forced to remove him from school on account of his inability to keep up with even the lowest grade classes. During the past year he has had peculiar athetoid movements of hands. He has had an eruption on the face for a number of years. The eruption consisted of innumerable tiny pin head sized nodules, from yellowish to dark red in color. Abdominal examination demonstrated a hard nodular mass, the size of a grape fruit, in the right loin. The mass was easily balloted from the loin and was slightly tender on pressure. The rest of the physical examination was negative. Roentgen-ray examination of the urinary tract demonstrated a large shadow which might be a considerably enlarged kidney occupying the entire right renal region. A typical nephrectomy was done. The kidney removed was three times the normal size, very soft and friable, with necrotic infected areas. The pathologic report was hypernephroma.

Scott, W. J. M. SUPRARENAL AND THYROID INTERACTION. [Jl. Exp. Med., August, 1922.]

This experimental study on cats was undertaken after it was demonstrated that rabbits were not appropriate experimental animals, partly because their heat regulation is unstable and partly because supernumerary suprarenal glands are common. Partial excision proved unsuitable, in that it was impossible to control the degree of functional disturbance induced, short of fatal suppression of the functions. Ligature of the veins was found to yield better results, although inconstancy of results arose as a consequence of the establishment of collateral circulation. The extent of this compensation could not be foretold nor regulated. Freezing, on the other hand, was a method by means of which the degree of injury could be varied at will. When the injury was relatively slight, no distinct changes were noted. In especial the heat production was not increased beyond 10 per cent. The cats ate and slept well and behaved like normal cats. When the injury was greater, the heat production was increased by more than 10 per cent above the highest preoperative figure. The highest reading was 44 per cent above the highest preoperative figure. This increased metabolism was associated with improved nutrition. The hair became sleek and shiny; the appetite was

enhanced. Loss of weight was frequently observed, but in some cats there was an increase. The animals became extraordinarily alert and active and at times restless. The respiration was increased in rate and depth. Diarrhea was common. After a time the heat production suffered a diminution. Dr. Scott is inclined to regard this as an indication of exhaustion of the thyroid glands. The exhibition of potassium iodide led to a prompt return to normal conditions. When the injury to the suprarenal glands was so severe that death supervened sooner or later, the heat production was diminished. In extreme instances the result was indistinguishable from that of removal of both glands. After death the cortex was found to be extensively necrosed, although the chromophilic properties of the medullary cells were well maintained. It is necessary to mention that no effect was produced in cats subjected to the same operative procedure with the exception that the neighboring tissue was frozen, but not the suprarenal glands. The signs and symptoms in the severer forms of suprarenal insufficiency are of great interest. Gastric ulcer was seen more than once. Diarrhea was common and usually occurred during the period of maximum disturbance. All the animals revealed an intense asthenia, with an obvious breakdown of some part of the nerve-muscle motor mechanism. In other words, the cardinal symptoms of Graves' disease were simulated in the cats whose suprarenal glands had suffered severe injury. That the failure of these glands stimulates an immediate hyperplasia of the thyroid glands with a tendency to rapid exhaustion is demonstrated in many of the protocols. It is not improbable that the asthenia, gastric disturbance and cardiac weakness of Addison's disease depend on the primary failure of the suprarenal cortex and the later exhaustion of the vicarious thyroid function.

Frisch, A. V. FAMILIAL BRONZING. [Wien. Arch. f. innere Med., IV, No. 1.]

Clinical record of a case of Addisonian bronzing in three males of one family. The mother and the eight children had all been unusually dark. The three men looked as if they had Addison's disease, but the brothers had been healthy except for cirrhosis of the liver, not interfering materially with the general health. The bronzing was interpreted as congenital.

Daniélopou, D., and Carniol. EPINEPHRIN TESTS. [Ann. de Méd., XII, No. 2.]

These authors, primarily stimulated by the Eppinger and Hess vagotonia hypothesis, made a series of pharmacodynamic tests. Injections were made into veins since cutaneous injection is too variable. Blood pressure, the plethysmographic findings, the pulse, and the subjective sensations were recorded. The doses of adrenalin were 1 c.c. of a 1:100,000 solution, reducing gradually to 1:1,000,000 or increasing to 1:20,000 according to the situation. Physiologic saline was the vehicle.

Twenty supposedly healthy persons were tested. This research supplements previous work by the same writers with atropin, physostigmin and calcium chlorid. They assert that with these four tests we obtain instructive oversight of the functioning of the involuntary nervous system. It throws an entirely new light on the therapeutic use of drugs and explains the difference in the reaction to drugs in health and disease.

Houssáy, B. A., and Lewis, J. T. SUPRARENAL ECTOMIZED DOGS. [Rev. d. l. Asoc. Méd. Arg., XXXV, 211-212.]

This is an experimental study on dogs. The authors show that the suprarenal medulla can be entirely removed from dogs, leaving only the cortex on one side, without immediate indications of sickness. The response to adrenalin and pituitary and the pupil reactions to cocain, atropin and epinephrin seemed to be the same as in normal dogs. The animals died if the cortex was excised.

Marine and Baumann. SUPRARENAL INSUFFICIENCY ON THYROIDECTOMIZED RABBITS. [Journ. of Metab. Research, I, No. 6, J. A. M. A.]

Nine additional experiments on rabbits made by Marine and Baumann show that thyroidectomy prevents or greatly diminishes the rise in the respiratory exchange which usually follows severe bilateral but sublethal injury to the suprarenal glands with intact thyroids. It is apparent that a thyroid-suprarenal cortex interrelationship exists, which is separate from the thyroid chromophil tissue interrelationship. The nature of this relationship is unknown but the evidence suggests that the suprarenal cortex, as one of its functions, exercises an inhibitory or regulatory control over thyroid activity and when this is sufficiently crippled, as by vessel ligation, freezing, or partial removal, the thyroid automatically responds with increased functional activity, resulting in increased heat production if a sufficient amount of the iodine containing hormone is liberated. There is evidence that single doses of iodine (25 mg. potassium iodid), administered by mouth, increase the heat production in suprarenalectomized rabbits with incomplete thyroidectomies. There is also evidence that sufficient but sublethal suprarenal insufficiency in rabbits and in cats causes a rapid loss of iodine from the thyroid. These observations throw light on the thyroid-sex gland interrelationship known since antiquity and probably have an important bearing both on the etiology of simple goiter and of exophthalmic goiter.

Hartman, F. A., Waite, R. H., and McCordock, H. A. LIBERATION OF EPINEPHRIN DURING MUSCULAR EXERCISES. [Am. Journ. of Phys., LXII, No. 2.]

In this laboratory study the authors maintain that an increased dilatation of a denervated pupil produced by excision of the superior cervical ganglion is due to epinephrin when the animal is forced to great muscular

activity. The output of epinephrin bears a direct relationship to the character of the muscular activities. After the exercise ceases the increased epinephrin secretion persists for a few minutes and after vigorous exercise of long duration sometimes for a few hours. Considerable individual variations are observable. Epinephrin injections usually, although not invariably, improve the working power of the individual. These improvements resemble the "second wind" which is observed in normal cats accompanying dilatation of the denervated pupil. Fatigue convulsions are rendered worse or they come on more rapidly when adrenalin is injected.

Fitz Patrick, G. PREGNANCY AND ADDISON'S DISEASE. [Surg., Gynecol., and Obstet., July, 1922, p. 72.]

Eleven cases of Addison's disease complicating pregnancy are here historically reviewed and a personal case is added. A primipara, aged twenty-eight, twenty hours after labor, began to manifest irregular pyrexia, ascribed to sepsis. Eight days later deep cutaneous pigmentation, asthenia, mental lethargy, and diminished blood pressure were marked. The influence of pregnancy and labor on Addison's disease is frankly bad, if one judges by the recorded cases, in five out of eleven of which the mothers died before they had reached term or within a few days after labor. Pregnancy may act as a stimulus rendering a latent Addison's disease manifest. Cases in which the disease has been recognized before pregnancy appear to undergo an intensification of the signs and symptoms. Fetal prognosis is bad. Abortion is frequent. In none of the cases was there uterine atony or insufficiency at or after labor, so that if adrenalin plays any part in the mechanism of labor the conclusion must be drawn that the loss of adrenalin of suprarenal origin must have been compensated for in some unknown manner. Suprarenal and thyroid therapy was of definite service.

Hurst, A. F., Tanner, A. E., and Osman, A. A. ADDISON'S DISEASE, WITH SEVERE ANEMIA, TREATED BY SUPRARENAL GRAFTING. [Proc. Roy. Soc. Med., XV (Clin. Section), 19. Med. Sc.]

The authors report a case of Addison's disease in which suprarenal grafting caused improvement, at any rate up to the present. During four months of medical treatment, the patient became very anemic and the systolic blood pressure fell to 70 mm. Hg. On March 25, 1921, a suprarenal gland from a man, just dead as the result of accident, was grafted into the subcutaneous tissue of the groin. The blood pressure remained as before. On April 11, a graft from a fetus just dead was inserted into the substance of the left testicle. A month later blood transfusion was performed. Slow improvement followed. A month later the systolic blood pressure was 95 mm. Hg.; in February, 1922, he had greatly improved; no vomiting for several months. Systolic blood pressure 115 mm. Hg.; hemoglobin 80 per cent; spleen still

palpable; pigmentation unaltered. The suprarenal graft was still palpable, the testicle having partially atrophied.

Stewart, G. N., and Rogoff, J. M. MORPHINE HYPERGLYCEMIA AND THE ADRENALS. [The American Journal of Physiology, Vol. LXII, pp. 93-112.]

We have shown that the hyperglycemia associated with etherization, asphyxia (1), (2) and piqûre (3) is not essentially dependent upon the liberation of epinephrin from the adrenals, since it can be obtained, and apparently in as high a degree as in normal animals, when the adrenals have been removed or the epinephrin output from them interfered with. We have now to report observations upon another form of experimental hyperglycemia, that produced by morphine, in which the adrenals appear to intervene in some way, at least to the extent that the occurrence of a definite hyperglycemia is far more constant when the adrenals have not been interfered with than after the various adrenal operations practiced by us (removal of both adrenals in rabbits, removal of one adrenal with denervation of the other, or of one adrenal and large portion of the other with denervation or destruction of the medulla of the remaining fragment in cats and dogs). An explanation of the phenomenon is not attempted at present, especially in view of the fact that the general behavior of cats under the influence of morphine is so different from that of rabbits and dogs. It does not seem probable that the morphine hyperglycemia in the normal animals is an "adrenalin hyperglycemia," due to the stimulating effect of the drug upon the epinephrin output, although we have shown that morphine increases the output in cats, since in dogs little, if any, increase in the epinephrin output has been demonstrated. It is nevertheless possible that although the morphine hyperglycemia may not be an "adrenalin hyperglycemia," in the sense that the epinephrin content of the blood is raised to, and maintained at or above the threshold value necessary for the production of hyperglycemia when adrenalin is artificially injected, it may be facilitated by the ordinary output of epinephrin. However this may be, the morphine reaction seems to be a test which distinguishes animals subjected to the various adrenal operations from normal animals, from which they may otherwise be indistinguishable. A knowledge of the mechanism of the morphine hyperglycemia may therefore throw light upon the physiology of the adrenals. The average blood sugar content, before morphine was given, of the cats, dogs, and rabbits subjected to the adrenal operations described was the same as the average for the corresponding groups of control animals. There was no evidence that the degree of excitement of the animals, whether normal or after the adrenal operations, influenced the sugar content of the blood speci-

¹ Stewart and Rogoff. Am. Jour. Physiol., 1917, XLIV, 543.

² Stewart and Rogoff. Am. Jour. Physiol., 1920, LI, 366.

³ Stewart and Rogoff. Am. Jour. Physiol., 1918, LXVI, 90.

mens collected before morphine was given. The average sugar percentage for "quiet," was approximately the same as for "excited" animals of the same group. The average of the rectal temperatures of the control animals (before morphine was given) was the same as that of the animals which had undergone the adrenal operations. [Author's abstract.]

Wright, S. DIAGNOSIS OF SUPRARENAL INSUFFICIENCY. [Lancet, July 1, 1922, Vol. II, No. 5,157, p. 14.]

This clinical study lends support to the view that Sergent's white line is not as specific as thought. One hundred healthy subjects were tested and the white line of Sergent was found in many normal subjects. A number of analogous physiologic responses are described. The white line is not necessarily related to suprarenal insufficiency or to abnormally low systolic or diastolic pressure. It may be produced by local emptying of the capillaries from the active contraction of some elements in their walls, and it quite independent of the condition of the arterioles. A nervous mechanism of the nature of an axon reflex may be involved.

Oppel, V. A. THEORY OF SUPRARENAL ARTERIAL GANGRENE. [Lancet, July 15, 1922.]

A spasm of the arteries, causing a complete blanching of the fingers is not an infrequent clinical experience and may be ascribed to a comparatively slight increase in the quantity of adrenalin circulating in the blood of such patients. As a result of his experiments, the author asserts that in human pathology, in suprarenal arterial gangrene, the concentrations of adrenalin must be less than one in one hundred million, as concentrations of about one in eighty million produce ischemic paralysis, which, if such concentrations are maintained for some time, must rapidly end in gangrene of all the limbs simultaneously. Clinically, no such occurrence is known. In human pathology, the hyperadrenalinemia only gradually disturbs the nutrition of the arterial walls with a resulting change in them and in the contained blood. The existence of such an hyperadrenalinemia is recognized by an increase in the vasoconstrictor effect of the blood serum occurring in so-called spontaneous gangrene. The author's contention is also substantiated by the result of treatment of the so-called spontaneous gangrene by excision of the left suprarenal gland, on the one hand, and by the pathological anatomical data on the other.

Labbé, M., et al. SUPRARENAL TUMOR. [Bulletins de la Société Médicale des Hôpitaux, Vol. XLVI, No. 22, p. 982.]

A clinical record of a woman, twenty-eight years of age, who had paroxysms of constriction in the epigastrium with vomiting and intense vasomotor disturbance. The blood pressure fluctuated up and down rapidly and more markedly than any recorded. There were two attacks of pulmonary edema, the second causing death. A large tumor in the left

suprarenal medulla was found. The digestive and the cardiovascular apparatus were sound.

Wertheimer, E., and Duvillier. EFFECT OF SUPRARENALECTOMY ON NERVES. . *Echo Médical du Nord*, Vol. XXVI, No. 28, p. 229.]

In dogs and cats the excision of the suprarenals does not seem to interfere with the splanchnic control of intestinal contracture. The authors maintain, therefore, that such intestinal activity is not dependent upon the adrenalin in the blood supply.

II. SENSORI-MOTOR NEUROLOGY.

1. CRANIAL NERVES.

Smith, E. Elliot. VISION AND EVOLUTION. [B. M. J. Ed., February 17, 1923.]

Elliot Smith gave the third of his series of Montgomery lectures, dealing with the general subject Vision and Evolution, at the Royal College of Surgeons in Dublin. In the first of this series, which was given in December, 1920, he discussed the problem of the reconstruction of man's pedigree for the purpose of determining exactly what changes occurred in the brain at each step in the progress of man's ancestors toward the attainment of human rank. Before the commencement of the Eocene period in a particular group of primitive tree-living mammals the importance of vision and the extent of visual representation in the cerebral cortex (already increased as the result of arboreal habits) became further enhanced, and this was responsible for bringing the Primates into existence. The continuance of this process led to the still further enhancement of vision in one subdivision of the Prosimiae known as the Tarsioidea, one member of which, the Spectral Tarsier, has persisted in Borneo, Java, and elsewhere from Eocene times until the present with practically no change. The importance of *Tarsius* in this investigation is that it represents the branch of the Prosimiae in which vision for the first time became the dominant sense, definitely displacing smell as the chief guide of the animal. The suborder Tarsioidea has the very important significance that it represents the group from which the apes and man were derived, so that the comparison of the brain of *Tarsius* and the most primitive monkeys enables us to determine what was the nature of the process which led to the origin of the higher Primates. Professor Elliot Smith made use of the observations of the living *Tarsius*, and of photographs by Mr. W. E. Le Gros Clark, F.R.C.S., who also sent him from Borneo most of the material for the research. In the second lecture, which was given in January, 1922, the significance of the acquisition of true stereoscopic vision was discussed; the monkeys, it was explained, came into existence when one particular group of Tarsioidea acquired

the powers of stereoscopic vision. The development of these higher powers of vision acted as a most profound stimulus to almost every part of the cerebral cortex. The visual area itself became further enlarged and more highly specialized, mainly for the purpose of establishing more abundant and more intimate connections with the other cortical areas, as well as with other parts of the brain. But the change which was most noteworthy was the sudden expansion of the prefrontal cortex, and this was due primarily to the development of a much wider range of conjugate movements of the eyes and a further development of the power of convergence. The ability to focus the two images of an object with exactitude on corresponding parts of the retinae prepared the way for the development of the macula lutea, so that the animal acquired the ability to appreciate more fully the nature of objects on the outside world, their exact position, their form, size, and texture. This stimulated the animal's curiosity to examine and handle things, which not only led to the cultivation of the sense of touch and the acquisition of higher powers of skilled movement, but also enabled the animal to train its powers of appreciating form and spatial relations and to learn by experience the meaning of events which were happening around it. This fuller understanding of the outside world gave added importance to information collected by all the senses, even the sense of hearing, and led to the further development of most of the cortical areas. The fixation of vision represents the germ of the powers of attention and of mental concentration in general. In the third lecture, which was given on January 29, 1923, it was pointed out that the essential factor which enabled these great developments in the cerebral cortex to be brought about was in the last resort entirely dependent upon the acquisition of a wider range of conjugate movement and a much greater control over such movements to give the precision and accuracy which were essential before real vision as we interpret the word could be acquired. The development of these more extensive powers of linking up the movements of the two eyes and acquiring a more precise control of convergence was the result of a very complex series of developments in the brain. They were dependent not merely upon the elaboration of a prefrontal cortical area, but also upon the transformation of the ocular motor nuclei in the midbrain and certain other changes in the connections between both the midbrain and the cerebral cortex with the cerebellum and the vestibular nuclei. Different aspects of these problems have been elucidated by the investigations of Dr. Wilfred Harris, Mr. Treacher Collins, Professor Winkler of Utrecht, Dr. Brouwer of Amsterdam, and Professor John Hunter of the University of Sydney, and the service which the lecturer tried to render was to correlate the results obtained by these investigators with his own work on the cerebral cortex, and to interpret the respective rôles of the cortex and midbrain in this process. The wide range of independent movement of the eyes of vertebrates below mammals becomes restricted in mammals

when a mechanism for effecting automatic conjugate movements begins to develop. The extension of the range of these linked movements is acquired very gradually in man's ancestors; and the close correlation between the range and precision of conjugate movements and the development of the cerebral cortex is a clear indication of the extent to which our intellectual powers have been built up on the basis of visual experience. The elucidation of the details of the process requires so many illustrations to make it intelligible that it is Professor Elliot Smith's intention to publish a book presenting the three Montgomery lectures, together with the three Morison lectures on the evolution of the intellect given at the Royal College of Physicians of Edinburgh in 1922, which deal with essentially the same problem from a somewhat different angle.

Onfray. DIABETIC RETINITIS. [Ann. d'Oculist, August, 1922, p. 599.]

Onfray summarizes a study of diabetic retinitis with reference to life and vision. He concludes that nine-tenths of diabetics affected with retinitis show vascular hypertension and renal insufficiency, that in half of these patients the renal insufficiency is only just commencing. These patients may be divided into two classes by measuring the vascular tension and by study of the coefficient of urea elimination. Untreated, such cases are liable to a fatal issue in two or three years; subjected to a hypotensile regimen, they may survive five, six, and even ten years. Although complete blindness is rare, the prognosis as to sight is grave in all.

Cushing, H. FURTHER CONCERNING THE ACOUSTIC NEUROMAS. [Laryngoscope, XXXI, 211. Med. Sc.]

Cushing believes that early and precise diagnosis and localization is more constantly and certainly attainable in the case of acoustic neuromas than is the case with intracranial tumors elsewhere. Since the publication of his monograph on this subject, in 1918, forty-seven additional cases of the kind have come under observation and treatment. As before, they represent 7.3 per cent of all verified intracranial tumors, 24.5 per cent of all infratentorial tumors, 60.3 per cent of all extracerebellar tumors, and by far the greater percentage of all tumors with symptoms referable to the cerebello-pontile angle. He concludes that when tumor symptoms point to the angle as the seat of the lesion and begin with deafness we may be fairly certain that we are dealing with an acoustic neuroma. He gives clinical reports of several cases in which, despite the now readily recognizable picture of acoustic neuroma, errors of diagnosis were made, in some instances avoidable errors. In all these instances prolonged aural and nasal local treatment had been employed and the signs of intracranial tumor unnoticed or misinterpreted. In this connection it may be mentioned that the paper was originally read before an otological and laryngological society. There are also described a case of endothelioma of the Gasserian envelopes, which gave a picture of acoustic neuroma, and one

of glioma (?) originating in the eighth nerve nucleus and giving a similar clinical picture. Discussing the method of surgical approach to acoustic neuromata, he expresses the view that partial enucleation is all that can be attempted, until precise diagnosis allows of intervention at a much earlier stage than is now commonly possible. In conclusion, he states his objections to the translabyrinthine operation advocated by Fraser of Edinburgh. [F. M. R. Walshe.]

Redlich, E. PATHOLOGY OF ARGYLL-ROBERTSON PUPIL. [Wien klin. Woch., XXXV, No. 38.]

Redlich attributes the Argyll-Robertson phenomena to a lesion of afferent fibers of the nucleus of the oculomotorius. The lesion is due to the metaluetic affection of the ependyma of the aqueduct of Sylvius, analogous to a meningitis.

Heyninx, A. THE SENSE OF SMELL. [Quarto, Brussels, 1922; Ed. B. M. J.]

The possession of a sense of smell is one of our natural gifts, but the possession of any knowledge concerning that sense belongs to few. Owing to the inherent and obvious difficulties of the matter investigations have been relatively scanty. Yet the literature of neglected subjects such as this is, none the less, not barren. Various attempts have been made to classify odors and to explain the mechanism by which they reach our consciousness. Of classifications of smells the simplest, and that which will most appeal to the average man, is that of Haller, who in 1763 made them into three classes—agreeable smells, intermediate smells, and disagreeable smells. So might Falstaff himself have described smells, and by this rule our public authorities work to this day—to our great profit.

In more recent years valuable contributions have been made by Zwaardemaker, whose work created considerable discussion, and whose olfactometer, described in our columns many years ago, opened up wider fields for research. In a thesis recently presented to the University of Brussels, A. Heyninx, in a handsome and well-documented quarto, attacks the problem anew. Zwaardemaker had done a service in reducing the somewhat vague sense of smell to something measurable and capable of clinical application. He had classified odorivectors, and had shown, moreover, that in the same class of odoriferous bodies identical or similar intramolecular groupings are found. But the chemical formulae may vary greatly, and yet a similar smell result—for example, hydrocyanic acid and nitrobenzol have the same odor of bitter almonds. Heyninx attempts to put the olfactory sense upon a rigid physical basis. In the first place, he laments that we can only speak of smells by periphrasis—by comparing a given smell with that emitted by some well-known object. Before the discovery of the monochromatic elements of the solar spectrum it was by such roundabout means that colors were designated. Indeed, Heyninx wishes to set up a spectrum, as it were, for smell with a classifi-

cation dependent on variations in the wave-length. By ingenious and closely reasoned argument, betraying considerable knowledge of physical chemistry, Heyninx arrives at the conclusion that the activating mechanism of odors is by the vibration of wave-lengths, the same as those of the ultra-violet part of the solar spectrum. He is attracted by Castelli's theory of resonance in vision—the resonance of the retinal pigment granules in response to waves of light. He uses this theory to explain the pigmentation of the olfactory mucus membrane, and finds that the size of the pigment granules corresponds roughly with the wave-length which odorous bodies emit. An important argument in this connection is contained in a paper by Ogle on anosmia; he states that albinos, who have no olfactory pigment, have no sense of smell. Heyninx describes his experiments on the excitor mechanism of olfaction; they show that it is not a radio-active energy, nor a chemical, nor a colloidal, nor a spectral absorption, but a moleculo-vibratory energy which activates our affective paths. Dr. Heyninx's contentions are deserving of attention, and his large and extremely well produced book will be found a mine of information with a rich bibliography.

5. PES; INTERBRAIN; THALAMUS; STRIATUM.

Mourgue, R. THE CLINICAL SYNDROME OF DECEREBRATE RIGIDITY OF S. A. K. WILSON STUDIED IN A CASE OF TORSION SPASM FOLLOWING EPIDEMIC ENCEPHALITIS. FIRST ATTEMPT IN THE PATHOPHYSIOLOGY OF THE EXTRAPYRAMIDAL SYSTEM. [Arch. suisses d. Neur. et d. Psych. du Prof. de Monakow (4 photos), Vol. XI, No. 2.]

In this study we take up the preceding observation, adding to them some pharmacodynamic researches upon the behavior of tonus under the influence of certain injected substances, adrenalin, pilocarpin, atropin. We take as a criterion of the variations of tonus Kohnstamm's test (Katatonusversuch) which apparently has not yet been studied in France. Only atropin has given us a clear positive result. But as the title indicates, this study is essentially devoted to the examination of decerebrate rigidity in our patient. This only appears when he holds himself upright, that is, when gravitation is in play. This attitude is minutely analyzed, and if we ask ourselves to what biologic end this corresponds we find ourselves looking back to the works of Sherrington in which he discusses a reflex of the erect position (standing reflex). We endeavor first to examine different objections that might be made to this interpretation. The appearance of this condition especially during walking has nothing paradoxical to it if one considers that every intentional movement requires as a necessary preliminary condition the setting into activity of all the static system of the musculature. But we guard against simplicity of interpretation for the little that we know of pathological anatomy as well as our knowledge of normal anatomy advises us imperi-

ously here. For this reason we review, on the one hand, the descriptions of Vogt (case of Thomalla), of Wimmer, and of Cassirer (essential diffuse lesions); on the other hand the extremely complex structure of the system called extrapyramidal (Winkler's work particularly). This long discussion gives evidence of the impossibility of the corpus striatum alone being involved. Professor von Monakow, to whom we have submitted this work, with the great authority which is attached to his work in anatomy, has kindly confirmed for us the correctness of this morphologic statement. *We think in fact that any physiological hypothesis could not reasonably be set forth without this preparatory work.*

From this point of view we attempt to show that our case is a typical example of *disintegration with liberation of function* (Head). It is thus that one may comprehend the fact of the paradoxical manifestation of the disappearance of hypertonia in the four extremities while walking. In this case the proprioceptive system does not enter into play. On the other hand, in the erect position it is liberated without check. The presence of Babinski of the right side is equally capable of interpretation as a phenomenon of liberation and gives rise to a discussion on the interpretation of this symptom which is not necessarily the indication of an anatomical interruption of the pyramidal bundle (Spiller's case). We refer it to a cortical exhaustion and recall in this connection a very instructive experience of Graham Brown.

We are led thus to speak of the indirect connection between the intermedio-prefrontal region and the corpus striatum which we accept with Cajal, Ariëns Kappers, and C. K. Mills. We recall the experimental results obtained in man by surgical removal of the precentral arm area in certain cases of choreoathetosis. There remains the position of the right foot in varus equinus which hardly seems to correspond to the standing reflex. This point leads us with the aid of Professor Vialleton to undertake the critical examination of a theory very much in vogue among the German neurologists at the present time, thanks especially to the work of Foerster, by which the attitudes observed in the syndrome called striate would represent regression to the simian stage of adaptation to arboreal life. We show that the theory is untenable.

Finally we enter upon the question of the biologic processes which condition the phenomena thus far presented. This is especially the question of the correspondences which arise here between the cerebral and the hepatic affections. For this purpose we draw attention at length to a series of researches of very great interest which have passed completely unnoticed in France. These are the studies of Fuchs and of Pollack upon experimental encephalitis and those of Crile upon the relation of the liver and the brain in exhaustion. Our conclusion is that the pathogenesis of the syndromes called extrapyramidal should be investigated with the indispensable aid of a biologic chemistry (metabolism of proteid substances). We are led thus to discuss the results of the phar-

macodynamic investigation referred to at the beginning of this review. After having indicated the extreme complexity of this sort of study we recall the dualistic theory of the muscular innervation held by different physiologists and that of Frank, who admits beside a sympathetic innervation a parasympathetic innervation, and the reservation which so competent an authority as Langley makes upon this subject. As concerns the action of atropin upon the reflexes, we note that it has the power of calling forth the extension of the great toe on the left side. In our conclusion we remark that our work constitutes an attempt to interpret certain phenomena called extrapyramidal in terms of *neural balance*, as the English physiologists say, *i.e.*, considering the antagonistic actions of the different functional systems. We go on to remark that in the absence of autopsy it is not forbidden in following the situation clinically step by step to make hypotheses, but these ought always to satisfy three conditions: (1) To accord with the findings of anatomy. (2) To accord with the results of experimentation. (These have certain reservations.) (3) Clear distinction of the anatomic localization and the localization of function (v. Monakow).

We have noted in passing certain questions which only the more and more indispensable collaboration of different specialists permit us to solve and to indicate how difficult our task is made by the absence of every material aid in the asylums for aliens in France. [Author's abstract.]

Bazett, H. C., and Penfield, W. G. A STUDY OF THE SHERRINGTON DECEREBRATE ANIMAL IN THE CHRONIC AS WELL AS IN THE ACUTE CONDITION. [Brain, XLV, 185.]

All previous experiments on the "decerebrate animal" in the sense adopted by Sherrington have been acute in the sense that the preparation survived for a few hours only. The earlier experiments of Goltz and others on dogs, in which the animal survived for months, or even for over a year, differed in that the midbrain and the greater part of the thalamus remained intact, and the animal was not rigid and retained temperature control. In other words, these animals corresponded to Magnus and de Kleijn's "thalamus" animals, which were described in a recent number of this journal (Medical Science, VII, 109, 1922). Strictly speaking, therefore, the "decerebrate animal" replaced later by a permanent "release" stage. In some unilateral cases, flexor rigidity or bilateral extensor rigidity developed. They believe that the pathway, whose interruption is responsible for the appearance of the rigidity, decussates in the midbrain.

Occasionally in bilateral as well as in unilateral decerebrations flexor rigidity was observed. It is thus possible to speak of two types of decerebrate rigidity.

The close study of this paper in the original may be recommended to

neurologists, and it should serve as a useful corrective of the somewhat loose notions now current as to the features of decerebrate rigidity (*cf.* Medical Science, VII, 398, 1923). [F. M. R. Walshe.]

Miskolczy, D. DEVELOPMENT OF THE MEDULLARY SHEATH OF THE RHOMBENCEPHALON. [Arch. f. Psych. u. Nervkr., Vol. LXVII, Nos. 2, 3.]

Miskolczy continues the investigations begun by Hoesel, who studied the brains of the fourth, fifth, and sixth months of fetal life. Miskolczy examines the myelogenesis of the rhombencephalon in the latter half of the intrauterine period, the seventh, eighth, and ninth fetal months. He points out the absence of medullary substance in the superior olive, the ontogenetic course of development in the formation of the nucleus dentatus, also the difference between the myelogenesis of the pars basilaris and the pons tegmentalis. [J.]

Forbes, Alexander, and Miller, Richard H. THE EFFECT OF ETHER ANESTHESIA ON AFFERENT PATHS IN THE DECEREBRATE ANIMAL. [Am. Jl. Physiology, September, 1922.]

Crile maintained that ether acts not on the afferent side but on the motor side of the nervous path from the sense organs through the brain to the motor end organs. Sherrington argued that the action of ether occurs at synapses throughout the central nervous system. In order to determine whether or not ether acts on the afferent nervous path leading to the brain, decerebrate cats were used with the brain stem transected under deep anesthesia, at the level of the anterior colliculi, and exposed to permit the application of electrodes whereby the brain stem could be connected with the string galvanometer in order to record the action currents which mark the passage of nerve impulses. The cerebrum was entirely removed. In order to produce afferent impulses the sciatic nerve was stimulated with single break shocks from an inductorium. When the ether had been eliminated from the system after completion of decerebration, the galvanometer connected with the brain stem in the neighborhood of the fillet revealed an electric response to a single instantaneous stimulus applied to the afferent nerve. The response consisted of two distinct excursions, the first (the smaller of the two) occurring about 0.008 second after the stimulus, the second and larger excursion beginning about 0.02 second after the stimulus. Ether inhalation caused a very slight reduction in the first response but a large reduction in the second, this reduction beginning about the time that the disappearance of the first reflexes denoted light surgical anesthesia, and becoming very great with deep anesthesia. By shifting one electrode to the exposed medulla oblongata it was shown that the second and major excursion of the galvanometer, which almost disappears under deep surgical anesthesia, can almost certainly be identified with the activity of the second neurons in

the chain leading to the cerebrum. The results therefore confirm Sherrington's view that the action of ether is at the synapses. A peripheral nerve trunk can be shown by means of its action current to conduct normally in even the deepest surgical anesthesia. It follows from Adrian's observations on the all-or-nothing character of the nerve impulse that if an impulse succeeds in passing a partial block such as an imperfectly conducting synapse, it will, on reaching the normal fiber beyond, regain its full magnitude. Therefore, the observed reduction in the action current derived from the second neurone in the afferent chain leading to the brain presumably means not a reduction in the size of the individual nerve impulses in all the fibers, but abolition of impulses in some fibers and not in others. Under deep anesthesia the action currents become so small that it is safe to conclude that a considerable majority of the neurons here have been rendered inactive. [Author's abstract.]

Papez, J. W. THE THALAMIC END OF THE MEDIAL LEMNISCUS. MARCHI METHOD. [Proc. Amer. Assoc. Anatomists, in Anatomical Record, XXV, p. 146.]

When the medial lemniscus is cut in the tegmental region in the rat, Marchi preparations show that this bundle has two sets of endings in the thalamus. The principal terminals course along and in the ventral and lateral nucleus of the thalamus forming a narrow crescentic lemniscal stratum. The degeneration of these terminals is limited almost exclusively to this nucleus. No fibers enter the main portion of the zona incerta; none were traced to the striatum or cortex; a very doubtful few were observed in the substantia nigra and posterior commissure. The other terminals arise at right angles from the medial lemniscus in the caudal limits of the thalamus opposite the posterior commissure. They pass dorsally into the posterior nucleus of the thalamus in and against the course of the numerous thalamocortical fibers of this region. These fibers probably correspond to the group of dorsally directed collaterals described by Cajal (1900) in the mouse. In the adult rat these degenerated fibers appear to be coarser and not so numerous as those figured by Cajal. [Leonard J. Kidd, London, England.]

Westphal, A.; Sioli, F. CLINICAL AND ANATOMICAL CONTRIBUTION TO THE THEORY OF THE WESTPHAL-STRÜMPPELL PSEUDOSCLEROSIS (WILSON'S DISEASE), ESPECIALLY ITS RELATION TO ENCEPHALITIS EPIDEMICA. [Arch. f. Psych. u. Nervkr., Vol. LXVI, No. 5.]

The authors could not diagnose the case reported from the clinical picture. Anatomically there were found changes similar to those found in Wilson's disease combined with those of encephalitis lethargica. This fact of the close relation of the latter disease to pseudosclerosis is important in relation to the etiology (toxic-infectious) and symptomatology of the case here given. The text is well illustrated.

Kastan, M. SIGNIFICANCE OF THE CONDITION OF THE LIVER IN LENTICULAR NUCLEUS DISEASE. [Arch. f. Psych. u. Nervkr., Vol. LXVI, No. 5.]

The author draws his conclusions from five cases reported. The marked and bizarre arm or leg movements and tremors are related to alteration of the liver in the form of hypertrophic cirrhosis with at first increase and finally decrease of the volume of the liver plainly demonstrable by X-ray. Cases with marked enlargement of the liver belong to those, however, who manifest chiefly stiffness and slight tremor.

Schäffer, H. MYOTONIC MOTOR DISTURBANCE. [D. Zschr. f. Nervhik., LXVII, 225.]

Schäffer submits to a detailed criticism the theory of Gregor and Schilder that the myotonic contraction which outlasts the voluntary relaxation impulse comes to pass through a proprioceptive reflex. He thinks that the myotonic disturbance originates within the muscle itself quite independently of central nervous influence. Myotonia consists of a weakened condition of the sarcoplasm toward stimulation. Pässler's original sarcoplasm theory of myotonia can be sufficiently modified to include explanation of all the anomalies which the myotonic muscle might present.

Simons, A. HEAD POSTURE AND MUSCLE TONE: CLINICAL OBSERVATIONS. [Ztschr. f. d. ges. Neurol. u. Psychiat., LXXX, 499; Med. Sc.]

The tonic-neck reflexes described by Magnus and de Kleijn (*cf.* Medical Science, 1922, VII, 109) have been recorded from time to time in man in various clinical conditions, but, in spastic hemiplegia, Marie and Foix alone, as far as we are aware, have reported the occurrence of tonic extension and flexion of the hemiplegic arm on rotation of the head (*Rev. Neurol.*, 1916, I, 3, and II, 145). Simons, however, is the first clinical observer to make a systematic examination of a large number of such cases (250) with a view to determining the extent to which tonic-neck reflexes may be developed. He finds that simple voluntary rotation of the head does not commonly evoke tonic reactions in the limbs of the affected side, but may do so. Passive rotation, on the other hand, never evokes them. When present, they obey the laws formulated by Magnus and de Kleijn, namely, extension of the arm when the head is rotated so that the face looks towards the paralyzed side, and flexion spasm when it is rotated in the reverse direction, and this irrespective of the initial posture of the reacting limb. He finds, in addition, that, even when head rotation does not produce a tonic reflex, it frequently modifies the form of the associated reaction accompanying forceful voluntary contraction of other muscles. Thus a firm grasp of the observer's hand by the normal hand, when the head is rotated to the paralyzed side, produces associated extension. When the head is rotated to the normal side, associated

extension follows. The leg reacts in the same manner, but less constantly than the arm. He did not find any unequivocal evidence of labyrinthine reflexes—that is, tonic spasm in the paralyzed limbs when the head is altered in position in relation to space. These reactions were uniformly lacking in all forms of extrapyramidal motor disease. A series of beautiful photographs illustrates the paper. [F. M. R. Walshe.]

Hallenvorden, J.; Spatz, H. INVOLVEMENT OF THE GLOBUS PALLIDUS AND THE SUBSTANTIA NIGRA. [Zschr. f. d. ges. Neur. u. Psych., Vol. LXXIX.]

The authors report five cases in one family of brothers and sisters with a similar disorder. The family consisted of twelve, of whom three died in childhood. Autopsy was performed upon one patient who died at twenty-four years of age after a protracted illness in which a tension finally developed into stiffness without pyramidal symptoms. There were found alterations generally diffused but chiefly distension of the nerve fibers, changes in the ganglionic cells. The myelin formation was thin in spots and there were sharply circumscribed areas in the globus pallidus and the substantia nigra, especially strong iron reaction, peculiar neuroglial elements, numerous extensive deposits. No essential alteration of the configuration and finer architectonic of the two centers. The circumscribed alterations were accepted as only unusual increase of physiological special reactions. The case is suggested as belonging to Vogt's status dysmyelinization. Perhaps there is here clinically hyperfunction of the centers affected. Emphasis is laid upon the close relation of the two centers.

6. ENCEPHALITIS.

Kling, C. THE VIRUSES OF HERPES AND EPIDEMIC ENCEPHALITIS. [Hygeia, Nov. 30, 1922, p. 913.]

C. Kling has carried out experiments on rabbits to ascertain whether the viruses of herpes and epidemic encephalitis are identical or not. The herpes virus was obtained from one case of pneumonia and from one case of herpes facialis. The virus of epidemic encephalitis was obtained from a district in the north of Sweden, where there had recently been a severe outbreak. The virus in each case was introduced into the cornea of a rabbit. The herpes virus provoked an intense purulent kerato-conjunctivitis in twenty-four to forty-eight hours, and an acute encephalitis followed, the changes in the brain differing in many respects from those associated with experimental epidemic encephalitis in rabbits. The inoculation of the virus of epidemic encephalitis into the cornea of a rabbit provoked a comparatively slight reaction, and it took about four to six months for characteristic changes to occur in the brain. For these and other reasons the author has come to the conclusion that Levaditi is wrong

in assuming that the viruses of herpes and of epidemic encephalitis are identical. In another series of experiments the author has found that the cerebrospinal fluid of patients who have developed Parkinson's disease after contracting epidemic encephalitis is infectious to rabbits even a year to a year and a half after the onset of the encephalitis. Some rabbits appear to have a natural immunity to this disease, but 50 to 60 per cent proved susceptible to inoculation with the cerebrospinal fluid of the subjects of post-encephalitic paralysis agitans.

Volpino and Racchiusa. INFLUENZA AND EPIDEMIC ENCEPHALITIS. [Presse Med., Feb. 28-March 10, 1923.]

Volpino and Racchiusa report that rabbits inoculated with virus from human influenza sputum developed a fatal disease closely resembling epidemic encephalitis in man. No bacteria were found in the rabbits, but the brain cells showed peculiar inclusions which resembled Negri bodies in rabies. Other findings suggested those of human epidemic encephalitis.

Thalheimer, W. EPIDEMIC (LETHARGIC) ENCEPHALITIS: CULTURAL AND EXPERIMENTAL STUDIES. [Am. Archives of Neurology and Psychiatry, Vol. VIII, No. 3, p. 286. J. A. M. A.]

The investigations of epidemic encephalitis by Loewe and Strauss, which antedate other similar studies, seem to indicate that a filterable, living agent, or virus, is regularly associated with this disease. This virus causes a disease in animals which is similar to, and in many animals identical with, epidemic encephalitis. The microscopic cerebral lesions in the animals are the same as those which have been found to be characteristic of this disease. From this virus, an extremely minute filterable organism was grown in the ascites-tissue culture medium perfected by Noguchi. Cultures of this organism likewise produced the characteristic disease and lesions in animals. Thalheimer confirms the findings of Loewe and Strauss in their entirety.

Sundelius. INFLUENZA AND EPIDEMIC ENCEPHALITIS. [Finska Läkarsällskapets Handlingar, March and April, 1922. B. M. J.]

The author here publishes charts showing the incidence in Helsingfors of influenza from 1908 to 1922. A separate chart is devoted to epidemic encephalitis, the outbreak of which occurred in the winter of 1920-21. This outbreak lasted about eight weeks, during which 201 cases were notified. In support of the argument that epidemic encephalitis is merely a cerebral manifestation of influenza, the author notes that the eight weeks' duration of this outbreak was approximately the duration of the various outbreaks of influenza, and he points out that practically every wave of influenza has exhibited some selective preference for an organ or groups of organs. Thus in 1918 influenza in Helsingfors was characterized by catarrhal manifestations, without pulmonary complications, and by a fever of a purely toxic type. At this stage gastric, nervous, and

rheumatoid forms of influenza were hardly known. In the spring of 1919 the dominant characteristic of influenza was the concomitant pneumonia. Later in this outbreak gastro-intestinal manifestations began to accumulate. When, therefore, it is evident that influenza picks out one system after another from time to time, it is natural to regard epidemic encephalitis as influenza of the central nervous system. As one of the author's charts shows, the rise and fall, as well as the duration, of the outbreak of epidemic encephalitis closely resembled those of earlier outbreaks of influenza. The author also notes that in earlier epidemics of influenza cases have been observed which were characterized chiefly by drowsiness.

Crookshank, P. G. EPIDEMIC ENCEPHALITIS. [British Medical J1.]

To the Editor: In a recent leading article in *The Journal*, reference is made to some views that I am supposed to hold, and which, it is said, are no longer seriously considered. I am sure you will allow me space to say that the belief that poliomyelitis and encephalitis lethargica have the same virus, or that the virus of encephalitis lethargica is the same, or a variation of that of poliomyelitis, does not quite accurately represent my position.

So far as I can see, there has not yet been put forward any single clinical, epidemiologic or pathologic criterion that clearly separates the vast mass of these nervous cases into two groups: that enables us to say definitely, in respect of *all* cases, which should be put on the left and which on the right. So long as this is so, it seems to me wise to use one common name, and to speak of cases of epidemic encephalomyelitis, or the like. But, if a clear division can be made, then we may use two separate names, and proceed to discuss and investigate the difference or community in respect of virus in the two groups. It by no means follows that differences in respect of virus should follow the same line of separation as clinical, or even pathologic differences. For the moment, in asking whether poliomyelitis and encephalitis lethargica have "the same virus," it seems to me that we are begging an important question: namely, whether the setting up of these two rather undefined concepts as those of two separate diseases is justified except as a temporary expedient.

Put in another way, we are begging an important question if we ask a pathologist to determine the virus in a case of "encephalitis lethargica" on one day, and in a case of "poliomyelitis" the next.

Such a pathologist might well reply: "I have read what Netter has said on this question: are you sure that your case of 'encephalitis lethargica' is not one of 'poliomyelitis of the cerebral type,' and your case of 'poliomyelitis,' one of 'encephalitis of the spinal type'?"

Our conception of poliomyelitis has gradually widened, during my lifetime, from one of an acute motor palsy of children depending on a lesion of an anterior horn, to the much broader notion put forward in the books of Dr. Draper and Dr. Ruhräh.

It seems to me that only a little extension is now required to bring the cases called "encephalitis lethargica" under the Heine-Medin, or "epidemic encephalomyelitis" umbrella; and so far no one has shown definite causes to keep them out from that friendly shade. Even the results of the bacteriologists and immunologists cancel each other out, and fail to give the "clear cut" some hoped for.

7. TESTS; REFLEXES; SYMPTOMS.

Gatscher. IRRITATION OF LABYRINTH AND ATAXIA. [Wien. klin. Woch., May 10, 1923.]

Gatscher stimulated the vestibular nerve by injecting cold water into the auditory canal. He found a distinct influence on the ataxia in multiple sclerosis and tabes.

Stevenson, George S. STABILIZING BRAIN TISSUE DURING FIXATION. [Am. Archives of Neurology and Psychiatry, Vol. IX, p. 763.]

The best method of fixation of whole brains that we have at present is immersion of the fresh brain in 10 per cent liquor formaldehydi with renewal of the fixative two or three times during the first week. However, this method has two undesirable features: one, marked swelling with first rise and then a fall of weight; and another, so-called shrinkage alteration which has been credited with pathological significance but which is so frequent as to be probably not always an evidence of pathological change. It was thought possible to regulate this weight change during fixation by using a salt along with formaldehyde. Preliminary experiment showed that of the salts used, sodium and copper sulphate exerted the most powerful restraining influence on this change of weight. Another experiment showed that with 10 per cent liquor formaldehydi, 0.8 to 0.9 per cent sodium sulphate or 0.7 per cent copper sulphate held the tissue most constant during this fixation period. However, these salt concentrations had to be reduced to prevent subsequent shrinkage, so that when fixation had been completed, 10 per cent liquor formaldehydi without the salt was sufficient. Trying this with whole brains whose weights were taken daily, it was found that no rule could be laid down which would be satisfactory for all brains, as there is much individual variation in response to the fixative. However, it was found that certain procedures were optimum. These consisted in reducing the sodium sulphate to 0.5 per cent in seven days and to zero in three to five days more, or with the copper at the end of the fourth or fifth and sixth to eighth days, respectively. Thirty c.c. of liquor formaldehydi may be added to the first sodium solutions on the second, third, fourth, and fifth days, and the first copper solution on the second, and third days to keep up the formaldehyde strength of these solutions. These salt fixations do not interfere

with staining. Microscopic examination of the tissue demonstrated that in most of the brains studied, which were largely on organic disease, the shrinkage alteration was not eliminated. [Author's abstract.]

Lowman, Chas. LeRoy. A STUDY IN GAITS. [Journal of Bone and Joint Surgery, April, 1923.]

The gaits considered are limps, or abnormal gaits resulting from a healed pathological process or from surgical operation. The limp is perpetuated, after healing, by persistence of the memory patterns formed when the feeling of weakness and fear of pain caused guarding of movement. After removal of the instability and of the pain the characteristic habit of progression still persists. An analysis of the elements entering into the limp should be made, and these corrected by motor reëducation—the superimposing of new motor memory patterns. There is often still left a residual degree of uncorrectable limp due to unavoidable mechanical factors. This may be made much less evident by assuming certain mannerisms of gait. The perfection of the mechanical appliances used, especially of the shoe, where a high heel and sole have to be used, is the most important single factor in reducing the unsightly and inefficient elements of a limp. The article discusses the construction of such shoes, pointing out the commonest faults and describing correct designs, the reasons therefor, and the best materials to be used. [E. N. Reed.]

Morton, D. J. EVOLUTION OF THE LONGITUDINAL ARCH OF THE HUMAN FOOT. [Jour. Bone & Joint Surg., Boston, January, 1924.]

This article is part of the report of investigations made by the author into the course of human evolution as indicated by an extensive study of the feet of living and fossil primates. The article may be regarded as a sequel to others, "Evolution of the Human Foot," Parts I and II, published by the American Journal of Physical Anthropology, Washington.

These foot studies are of very positive value to the study of human evolution, because they are not merely a morphological comparison of the various types of primate feet, but include an analysis of the direct relationship of structure and function, and also of the correlation of foot modifications with life habits and with adaptive changes in other parts of the body structure. Certain fundamental differences are disclosed in this mechanical analysis of the primate feet, by which the divergent courses of evolutionary foot development from an early primitive type of foot is clearly pointed out. These fundamental differences furnish a definite basis for classification of the modern types; but of greater importance is the fact that they demonstrate in very positive manner that in only one course of evolutionary change was it possible for the human type of foot to have been developed. Known facts and estimated characteristics of all the ancient and modern primates are drawn into this analysis and appear to completely accord with the writer's interpretations.

The indicated progress of evolution toward the foot of man, and the major factors involved, may be summarized as follows:

The *primitive* type of primate foot was characterized by a tightly clutching grasp performed chiefly by the hallux and the two outer digits. In this method of grasp the metatarsal bones were held immobile and the fulcrum of leverage action of the foot was necessarily located in the region of the cuneiform bones, immediately behind the metatarsals. *Tarsius* and *Galago* have developed these primitive characteristics to a high degree of specialization in their perching grasp and remarkable mid-tarsal lengthening.

The first fundamental change occurred in the transfer of the fulcrum of leverage from the cuneiform area to the heads of the digital metatarsal bones, as characterizes the simian type of foot. It was associated with improved adaptations of the nervous system and of muscle coordination for body balance in more active arboreal life. The change in leverage function resulted from a loosening and inconstant use of the earlier tight grasp enabling the metatarsals to join in the propulsive effort. The animal ran in a digitigrade manner on the larger branches as a quadruped would on the ground. The hallux became less divergent and importantly developed, and the primitive short digital metatarsals became longer through their inclusion in the leverage action of the foot. The distinctive characteristics of this quadrupedal simian type of foot are most highly developed in the ground apes.

A second fundamental foot alteration is characteristic of the *anthropoid apes*, and can be found in some of the larger New World monkeys. It comprises a change in the line of leverage action from the center of the foot through the third metatarsal bone (as observed in the lower primates and mammals generally), to between the first and second metatarsals. The change is recognized by the more distal position of the head of the second metatarsal to that of the third (the reverse condition obtains in the lower types). It was associated with a reversion to a constantly employed foot grasp, which facilitated balance of the body in a vertical position and with increasing use of brachiation (swinging by the arms) established the habitual use of erect posture as an arboreal acquisition. With the transfer of leverage action to between the first and second metatarsals, there occurred an increased inward slant of the facets on the os calcis, which support the astragalus; thus in terrestrial usage of such a foot body weight is strongly deflected upon its inner border. The resulting effect is shown in the foot of the gorilla, which is now predominately a ground-living animal; it comprises an increased development of the inner border of the foot, especially observable in the first and second metatarsals.

The human longitudinal arch in its contour and trabecular architecture accords completely with engineering laws involved in leverage; the location of the arch along the hypertrophied inner border of the foot

definitely substantiates the conclusion that the human foot must necessarily have evolved from one in which body weight had become concentrated upon the inner border, and was propelled forward between the first and second metatarsals, after the manner of the great ape foot. It therefore becomes obvious that not only do the characteristics of the arboreal ape foot represent a stage which was absolutely essential to the ultimate appearance of the foot in man, but they also give a clear and logical interpretation of the way in which man acquired his erect posture. The primitive and simian types of feet fail completely to satisfy the conditions by which a direct transition of the human model was possible, or by which man's erect posture and characteristic method of locomotion can be explained.

Fossil relics show that the erect posture of the body is of great antiquity, probably dating back into the Oligocene, also that the ancient apes were more erect than the modern ones. The ancient *dryopithecoid stock* affords a most favorable point of radiation for human and great ape development, both in regard to posture and to foot and limb developments: (1) at that stage man would have inherited a firmly established preference for the erect posture from arboreal ancestors, through adaptations of structure and nervous system which unfitted him for reversion to quadrupedal locomotion; (2) he would have possessed a type of foot which, through terrestrial bipedal usage, would have become modified directly toward the present human model; and (3) as the ratio of arm and leg development are traced backward in the apes and man there would not be the wide disproportion which now exists—the great development of the arms in the apes as a product of brachiation in arboreal life compares about evenly with the leg development of man as a terrestrial biped. The use of an erect posture from the very beginning of man's terrestrial existence completely divorced his arms and hands from the function of locomotion, and they were, therefore, free to be applied to other purposes more conducive to the development of mentality. [Author's abstract.]

III. SYMBOLIC NEUROLOGY.

1. PSYCHONEUROSES; PSYCHOLOGY.

Sokolnicka, Eugenia. ANALYSIS OF OBSESSIONAL NEUROSIS IN A CHILD.
[Int. Jl. Psa., Vol. III, No. 3.]

No abstract can ever do justice to an analytic portrayal of a neurosis. Even the analytic portrayal itself, as every analyst of any experience knows, is but a fragment, an abstract, a mutilated torso of the work done, contracted because of necessary limitations. This story concerns a ten-and-a-half-year-old boy, small, thin, and with obsessions of not touching things. His mother had to dress him and feed him. If anyone, above all his mother, touched anything with one hand the object touched had to be

put back in its former place, the same action carried out with the other hand, and then finally with both hands. If one object was placed beside another he became very nervous. If by accident he himself touched anything the mother must carry out the ceremonial. This ceremonial had many ramifications. Thus he was starved, because food might not have been put in in the proper way and hence was rejected. In feeding both feet had to be in proper line. He writhed in pain if any infringement of the ceremonial took place. He would fall into unconsciousness, fall in a rage, throw himself on the floor, tear the mother's clothes, twist her hands and even bite her. He would have a fit of convulsive sobbing and fall on a chair exhausted. One competent "neurologist" had called it epilepsy. When it was all over and he was made conscious of his actions he would weep and ask forgiveness. In these periods he was "too good." In addition to his compulsions he had frequent headaches, and complained of a stone rubbing on his chest. He was regarded as "gifted," although his intellectual activities were hampered by the headaches. The illness developed in the midst of great privations consequent upon the bolshevik revolution. Everybody in his environment was being "searched." The mother narrated his first symptoms as "lifting his feet and looking at the soles of his shoes." The child and mother were martyrs to the illness, and many obsessive activities were uncovered in the analysis. He thus obtained exclusive possession of the mother. His relation to his father had undergone a distinct reversal from love to hate. He would not allow him to kiss him, would not go out with him, nor be in the house alone with him. His mother could not move from him.

The treatment lasted six weeks. It was a modified psychoanalysis. In the beginning there were no dreams—two to three weeks—and later the dreams were few. The contacts were therefore sympathetic and pedagogic. Two features of the obsessive acts are taken up: Why if one object was placed upon another it affected him and why the space in front of an object to be moved had to be clear, and secondly, why everything had to be touched by both hands. He was asked what came to his mind about the origin of these things. He told of an occurrence: He became ill, and wanting to climb onto a balcony that ran round the house, his sister's nurse forbade him: "God would punish him by not letting him grow up if he did." He did it nevertheless. As to the "clear space": "The hand will grow shorter." He believed things grew this way once. His mother had to do things to prevent her being ill. Soon the study showed there was a secret taboo somewhere. No one must know it, or else it would not remain a secret. As yet nothing of a sexual nature had appeared. He then spoke of a servant being married. As to what "marriage" meant to him: "He was too little to know—he must not know." The analyst tried to show him this was a false idea. By trying not to think he gave himself headaches. She then explained in considerable detail the process of sexuality in ordinary terms of plant and

animal biology. This gradually led to the "secret" (p. 309). This was only magic, and not apparently sexual.

Mouja now became the subject of the discussions. Mouja had told him how babies came by the "laying of the man on top of the woman." Mouja was a forward child; he the timid child, who could only behave naughty like Mouja while in his unconscious fits. Mouja was the little patient's ideal and set fire to his sadistic activities. He told him about detective stories and terrible surgical operations. The analysis proceeded slowly and one symptom replaced another but had a close affiliation. The "stone on the chest" was resolved as a guilty conscience. The unconscious attacks were harder to resolve. They were shown as transgressions of parental inhibitions. Naughtiness was disguised by them; they were revenges on his mother who was so "naughty" as to create children with his father. The "make believe" character of these attacks was shown to him in the presence of his mother. The analyst then very cleverly provoked an attack, held him, and demonstrated to him the conscious part of his activities. She then showed him his illness was made of two parts, one real, unknown to him, and another which he was quite able to control. The latter had arisen from his being spoiled, and this was his method of getting his own way. When this was explained to him, he was brought to his mother, who promised not to pay any attention to his tantrums. He had to renounce the privilege of his illness. He struggled and gave up. His unconscious attacks then ceased. Similarly the mother's coöperation in opposing her response to his obsessive acts was worked out. The mother's illness, the analyst tells us, she does not go into.

Some dream analyses—unabstractable—now follow. There were only three of them. The first one showed that the vaunted innocence of childhood is one of those "conventional lies" of which society is so fond of deluding itself and of imposing upon childhood. The "father drives away the boys" because he don't want them to have intercourse with the mother was clearly revealed. The second dream analysis dealt with the theme of magic. He tries to overcome the father. His rage is an indication of his real impotence in overcoming the father. His masturbation, begun at four (inhibited by the mother prohibition, "keeping his hands outside the bedclothes"), and the replacing phantasies, were very difficult factors to handle. The patient frequently wanted to get away. His fear of castration came more and more prominently into the foreground. "Two hands," "two penises," to replace the one lost, is the underlying motive of much of the obsessive act material.

Thus little by little the analyst led back to the "prohibited" balcony venture. The thing prohibited was onanism. The thing common to all of the obsessive acts was: (1) *Touching*; a magic act or an enchantment, which makes possible the transgression of the prohibition (= onanism, as a substitute for sexual intercourse); (2) the *Ceremonial*; a magic

disenchantment, which prevented the consequence of the touching (= castration and illness, as a result of the onanism). The writer then discusses ambivalent mechanisms in the child's yes-no reactions.

Claude, H. PSYCHOANALYSIS OF OBSESSIONS. [Paris Medical, October 20, 1923.]

Partly as a result of R. de Saussure's sojourn in Claude's clinic and the work of Legros, Claude has become interested in psychoanalysis. This paper says the advantage of psychoanalysis over other methods of psychotherapy consists in the better preparation of the patient for the final therapeutic persuasion. He agrees with Janet that the unfavorable opinion of certain prominent French psychiatrists is unfair and regrettable.

Anthony, R. BRAIN OF NEANDERTHAL CHILD. [Bul. de l'Acad. Med., October 16, 1923.]

The findings after examination of the skull of a Neanderthal child found in France are here reported. The skull of the child is as widely different from the present-day child skull as the skull of the Neanderthal adult is from the present-day adult's. As regards the volume of the brain, it is similar to ours, but its shape presents entirely different characteristics.

Freud, S. DREAMS AND TELEPATHY. [Int. Jl. Ps., Vol. III, No. 3.]

As are all of Freud's contributions, extremely terse and to the point, no abstract can do them full justice. This one is no exception. It is a paper read before the Vienna Psychoanalytic Society in which he first warns his hearers that he will not attempt to solve the problem, nor even express his own conclusions, even if he had them. All he expects to do is to set himself the "modest task of examining the relation of telepathic occurrences, whatever may be their origin, to dreams; more exactly to our own theory of dreams." The general opinion has been that there is an intimate relation between the dreams and telepathic phenomena. He would propound the view that the two have little to do with each other. Even if the existence of telepathic dreams were established there would be no need of altering the present psychoanalytic conception of dreams. His material is slight. He cannot use his own dreams, as he states he has not had a telepathic dream so far as he is aware. Certain dreams may have had prophetic semblances, and waking life has had "presentiments," but these have never been fulfilled and therefore have been better understood as "subjective anticipations." One dream seemed to indicate the death of a son at the front. He returned, however, unscathed. Another dream announced a misfortune; it seemed to prophesy the death of a eighty-seven-year-old mother of two nieces. She did not die. These negative cases he urges are not used to justify any preconceptions. They are related as bits of his own experience. Further he adds that in his twenty-seven years of analytic experience he has never had a telepathic

dream in any of his patients, even though many related remarkable incidents which had made them believe in occult influences. He leaves it to others to explain such a fact. Neither is he embarrassed when asked about the published so-called telepathic dreams of the "psychic researchers." In none of these does he find any real attempt at a dream analysis, hence their negligibility. He therefore limits his remarks to two communications from correspondents unknown to him.

The first is presented in a letter which details a lengthy dream, offered by the writer to Freud for "literary account" and "research purposes." This letter and the reply, which Freud remarks does not really afford the proper material for an analysis of the dream, occupies several pages and must be read in the original to make the communication really adequate. Notwithstanding its inadequacy from the analytic viewpoint, the author picks out certain features which tend to show it is not "telepathic." The author's discussion shows more pregnantly than ever before the extreme complexity of the night life and the need for careful studious effort to understand these in their rich and varied manifestations. He alludes specifically to "night phantasies" which have not undergone the various mechanisms of the usual dream condensations, distortions, or dramatizations, etc., and are therefore pertinent material for modifications of his own hypotheses concerning the dream function. The antithesis of the inner mental life and the external objective reality, which latter is related to the "telepathic" function, is not solved.

The second case belongs to a different type, Freud writes. It was not a telepathic dream but concerned a recurrent dream from childhood on in a person who had had many telepathic experiences. He cites a letter which details a haunting dream of the thirty-seven-year-old correspondent persisting some "thirty to thirty-two" years. The writer seeks relief from the "haunting experience"; she furthermore writes that during this dreadful recurrent dream she frequently falls out of bed and often hurts herself quite seriously. Then follows her account (295-296). The dream (see 291-297). Then her memories—not abstractable—follow in the account.

To all this the author writes after he has made a partial analysis of the dream based upon the writer's scanty associations, which analysis is full of forceful ideas.

Bridgman, Olga. THE PSYCHOLOGY OF THE NORMAL CHILD. [Journal A. M. A., October 13, 1923.]

Every child comes into the world with a set of tendencies transmitted through the ages from two long lines of ancestors. He is what he is largely because of his family, his sex and his race. Education may do much to develop small or latent powers, but nature has set definite limits for each individual beyond which he cannot go. It is futile to try to develop qualities of which there is no inherent trace and foolish to believe

that tastes and abilities not ingrained can be created. Few human beings come near to the best use of all their faculties. Numerous accounts are available of accidents which have made necessary a complete change in the manner of living and have thus forced the development of latent and hitherto unsuspected powers. It is the function, then, of the environment to select and stimulate desirable qualities and to control and direct all. To educate a child in the true sense, it is imperative, first of all, to understand his native equipment and then to know all of the laws by which modification may take place. Beside these inherent factors, which must be reckoned with throughout the life of the individual, there are certain other characteristics which belong to him because he is a child and not an adult and which are altered or lost with the passing years. First, and of utmost importance, is the fact of youth. Among the natural endowments, there are certain instinctive tendencies, shared in greater or less measure by all persons, and appearing most prominently in childhood. Besides the instincts, there are the affective states, the dislikes and fears, and the pleasures and satisfactions, which are coming to be regarded as making up a large part of the character or the personality of the individual. In the intellectual field there are differences between the child and the adult, owing to the differences of experience and to what appear to be differences in the power of some of the mental processes. Memory is a faculty in which both nature and training are of great importance. The imagination of the child is an important element in his make-up and is often misunderstood. The thinking of children is characterized by seeming triviality, which results largely from the differences in the problems of the child from those of the adult. Clearly, a child, though bound by the limits of his inherited nature, presents many individual features that are characteristic of childhood. It is the purpose of child psychology to study these features and to seek out all laws governing their appearance and development and of education to select and stimulate desirable traits and to control and, in some cases, to transform or suppress undesirable ones.

Jung, C. G. ANALYTIC PSYCHOLOGY. [Br. Med. Jl. Correspond., May 17, 1924.]

On May 12th the first of two lectures was given in Mortimer Hall by C. G. Jung of Zürich in response to the invitation of a number of medical men and women, educationists, and others. The arrangements for the lectures were made by the New Era. The lectures consisted of a statement of what analytic psychology is and is not, a distinction necessary at a time such as this, when it is confused with the method known as psychoanalysis, and when inquirers are liable to suffer from the enthusiasms of rival schools. With reference to the theories of Freud, Dr. Jung said that in spite of the undeniable importance of sex, anything and everything did not depend upon that instinct. Such a broad hypothesis worked like colored spectacles, and other colors were obscured. Dogmatism and

fanaticism were always compensations for secret doubt. There was no tendency in man that was not balanced by another. As sex was a force that swayed man, there was always a natural power of self-assertion in him which helped him to resist any kind of emotional explosion. Severe restrictions upon the sex instinct and other impulses were to be found even among primitive races.

The instincts should not be regarded as fixed elements in the psyche. If the continuous operation of a single instinct were assumed, man would be as sexual as Freud said he was, or as intent on power as Adler said he was. But the two theories would be irreconcilable if regarded as fixed elements of the psyche. Instincts varied in strength and power to dominate. A mere bad mood could alter a man's psychic reactions profoundly. To recognize the psyche's protean life and constant metamorphoses was to admit a truth less comfortable than a one-sided rigid theory; but in this way the inquirer was liberated from the incubus of the "nothing but." Psychological studies should not be restricted to the psychological spheres without assumptions as to the nature of underlying biological phenomena. Things should be taken more on their face value. There was no race or tribe among whom religious phenomena were absent, and there was no justification for the assumption that religion or art were due to repressed sex. Sex was even an integral part of some religious experiences, and even animals had esthetic and artistic instincts. There was at the present time no correct appreciation of sex. Whenever an important instinct had been undervalued, an abnormal overvaluation was certain to follow. Where the one had been unjust the other would be unsound. No moral condemnation could make sex so repulsive and disgusting as the blindfold stupidity of certain Freudian literature. It amounted to a still more formidable depreciation of sex, and its intellectual crudities made scientific toleration superfluous. The school of Freud was carrying on repression in an effective way. Immense damage was done to feelings through the Freudian doctrine, although it was through decent feeling alone that we could hope to solve the sex problem.

In discussing the various methods of analysis Dr. Jung laid stress on the fact that the analysis of the unconscious only began when the materials reproducible by consciousness were exhausted. He preferred to speak of the analysis of the unconscious. Analytic psychology was concerned with complex mental phenomena and their manifestations in conduct. It reduced complexity to its elements, but it also tried to understand the psyche's creative activity. The desire to know into what formative elements the mental functions could be resolved might be very strong, but they must be dealt with as if they were definable organs of the mind. Analytic psychology had no academic laboratory; its laboratory was the world. The tests were real events in daily life; the persons tested were patients, friends, and ourselves. The pains and joys and terrors and achievements of real life were the material. The analytic method was

the understanding of life, as represented in the psyche of man. The adjustment of human conduct was its purpose. It was eminently practical. It investigated to give help; abstract science was its by-product, not its main purpose. It was medical as well as educational, and therefore as individual and experimental as possible.

Every living truth was individual, and not to be derived from a previously established formula. Each individual was an experiment and an attempt at a new adaptation. To the doctor and teacher this meant the study of each individual; they should be ready to drop all theories for the one purpose of finding the truth. It was wrong to assume that whenever a content was unknown it was necessarily repressed. The patient's mental independence must be preserved. People were incredibly eager to get rid of themselves. Practical medicine had always been an art, and the same was true of practical analysis. True art was creation, and creation was beyond all theories. "Learn your theories as well as you can, but put them aside when you touch the miracle of the living soul. Not theories, but your own creative individuality alone must decide."

Reynolds, E. S. HYSTERIA AND NEURASTHENIA. [Brit. Med. J., December 22, 1923.]

This author holds the antiquated Oppenheim view that traumatic neurasthenia is due to molecular nerve change similar to those of an ordinary acquired neurasthenia from business worry which recovers perfectly in weeks or months, yet, Reynolds thinks that in cases of more severe injury due to falls from heights or injuries to the head, and also if the accident has been a very terrifying experience (such as being whirled round a revolving shaft), it is possible for the nervous molecular changes to be so intense that recovery never occurs, in spite of full compensation having been paid. The man is "never the same as he was," and occasionally passes into melancholia and sometimes commits suicide.

Moos, E. PSYCHOTHERAPY OF SPASTIC CONDITIONS. [Zeit. f. Klin. Med., March 20, 1924.]

Moos reports several cases of spasm of the esophagus or colon. The usual treatment (atropin, etc.) gave no results. The patients recovered after psychotherapy or psychoanalysis.

2. EPILEPSIES.

Smith, O. C. STATISTICAL ANALYSIS OF CERTAIN PHASES OF EPILEPSY. [Am. J. of Psych., April, 1923; J. A. M. A.]

The main points of interest in Smith's study of age of onset and type of the disease manifested may be summed up as follows: Without regard to family history, in males the average age of onset is later than in females and this lies within the group having grand mal attacks without petit mal.

Furthermore, this particular type of case occurs more frequently in males than in females. When the cases are separated in groups for different family histories, the age of onset for both sexes is later in the negative group and more markedly so for males than for females. In regard to the finding that grand mal without petit mal occurs more frequently in males than in females, this is found to occur chiefly in the negative family history, whereas females show no marked differentiation.

Burckhardt, H. POST-TRAUMATIC EPILEPSY AND REPAIR OF THE DURA MATER. [Zent. f. Chir., August 18, 1923.]

Epilepsy arises after apparently complete recovery from a fracture of the skull or other laceration of the dura. He compares it with the pathological condition in which the brain becomes adherent to the torn dura mater, and as the cicatrix contracts that portion of the brain is fixed to the dura and subjacent bone and necessarily undergoes some distortion. This fixation of the cerebral surface to the skull explains the slow development of epilepsy, as firm cicatricial contraction requires time for the production of symptoms of irritation. Burckhardt describes the case of a man whose skull was fractured in a railway collision. Two years afterwards he developed epilepsy. The attacks increased in frequency, and an extensive resection of the site of the fracture was performed; the surface of the brain was exposed and the thickened dura carefully dissected off; an osteoplastic flap was raised with a pedicle large enough to secure an ample blood supply. The dural portion of this flap was attached to the edges of the raw surface, from which the old cicatrix had been dissected, and the repair completed by transplantation of fat and fascia to prevent further development of adhesions.

Orrico, J. CONVULSIONS IN CHILDREN. [Sem. Méd., April 5, 1923.]

This study makes the spasmophilic diathesis responsible for the convulsions occurring in young infants without appreciable cause. It may have been latent until some slight gastrointestinal derangement upsets the precarious balance. Convulsions from acetonemia are not uncommon. He encountered three such cases recently, with fatal outcome, in very young children.

Plass, E. D. SOME ASPECTS OF THE METABOLIC DISTURBANCES OCCURRING DURING THE ECLAMPTIC STATE. [Association for Research in Nervous and Mental Diseases, in New York City, December 27, 1922.]

The unknown etiological factor in eclampsia and the related group of "late toxemias of pregnancy" is probably operative in all normal pregnancies, but produces pathological manifestations only when the body's protective mechanism is insufficient. Although it is generally assumed that these conditions are due to the toxic action of some substance derived from the growing product of conception, the presence of a specific toxin has never been demonstrated. That there is an associated disturbance of

metabolism has been shown by numerous investigators, but the inconsistency of their findings argues against their etiological importance. Blood chemical studies have likewise failed to give much definite information. The most attractive hypothesis yet advanced is the "hydrops gravidarum" theory of Zangemeister, according to which water is the eclamptic poison and produces symptoms more or less mechanically. We have abundantly confirmed his essential finding that there is a hydremia or hydroplasma during normal pregnancy, and that it is more marked in the so-called toxic states. Moreover, we have shown that there is apparently a tissue retention of various substances, occurring in conjunction with the water retention. When a patient, who has had eclampsia, is convalescent, the plasma concentration, as shown by its protein content, becomes diminished, and this dilution is associated with a rapid increase of the nonprotein nitrogenous constituents of the plasma. This phenomenon is not due to the normal involution of the puerperal uterus, since it is normally not present, and, moreover, it occurs at the time when there is a marked polyuria, so that it is not associated with renal insufficiency, and may best be explained as the result of a release from the tissues of substances formerly held there along with the edema fluid. The tissue retention of waste products is opposed to our usual conception of an equilibrium between plasma and tissue, but with demonstrable changes in the circulation in the capillaries and, presumably, of their endothelium, it may conceivably occur. On such a basis, the clinical manifestations of eclampsia may be viewed as protective in nature. Alterations of the capillary walls, due to an, at present, unsuspected factor, permits waste products, and perhaps other materials, to pile up in the tissues. In an effort at readjustment, water is now retained and passes into the tissues to produce an edema, which offers increased resistance to the blood flow, so that the blood pressure rises. In much the same way the albuminuria, headache, epigastric pain, visual disturbances, and, finally, even the convulsions themselves may be looked upon as efforts upon the part of the organism to combat the underlying condition, whatever it may prove to be. The argument is essentially one for the mechanical interpretation of the symptoms of eclampsia, on the basis of their being protective in nature. The organic toxin theory is abandoned in favor of a physicochemical hypothesis, which is supported by certain definite laboratory findings. [Author's abstract.]

3. PSYCHOSES.

Bramwell, Edwin. PSYCHOTHERAPY IN GENERAL PRACTICE. [Edin. Med. J., Feb., 1923. B. M. J.]

Edwin Bramwell urges the importance of psychotherapy in general practice, since it is to the general practitioner that the best opportunities are given for studying the neuroses in their earliest stages. From such

a unique experience he should be capable of dealing with all but severe cases by the application of psychotherapeutic methods of suggestion and persuasion, and be responsible for their prevention. For him a study of the disorders of the mind is as important as the study of bodily ailments in the successful treatment of patients by psychotherapeutic measures, and he must be able to recognize the necessity for such treatment and be fully alive to the mental suffering often associated with the neuroses. To tell a patient so afflicted that there is nothing the matter with him constitutes both an act of cruelty and a display of ignorance which must eventually reflect upon the honor of the profession. The clinical teaching of the subject, if it is to be of use to the general practitioner, must remain largely in the hands of the general hospital physician, who has the necessary experience and material at his disposal, and alienists and pure psychologists in their teaching must avoid creating the false impression that psychotherapy is a specialty only to be taught and practiced by specialists. Psychoanalysis, requiring as it does much time and patience, ought only to be carried out by specialists able to devote adequate time to the treatment of individual cases, and it must not be confused with psychotherapy, which comes into the domain of the general practitioner, who should keep abreast with advances in this direction in so far as it has a direct application to his daily work.

Miles, W. R., and Root, H. F. PSYCHOLOGIC TESTS APPLIED TO DIABETICS. [Archives of Internal Medicine, Dec., 1922, XXX, No. 6, p. 767.]

Mental impairment is a common complaint in diabetic patients. In order to ascertain whether such impairment is the rule in this disease, Miles and Root applied a series of psychologic tests to a group of thirty-nine diabetics and a group of normal individuals for control. It was found that diabetic patients with hyperglycemia and glycosuria showed a decrement of about 15 per cent in memory and attention tasks. With treatment a rapid improvement was noted, but the normal status was usually not reached. In accuracy and quickness of movements five treated diabetics of long duration were 20 per cent below the normal.

Stern, F. HYPNOTIC DRUGS IN AFFECTIONS OF THE NERVOUS SYSTEM. [Klin. Woch., Feb. 12, 1923, p. 308, and Feb. 19, p. 355. B. M. J.]

F. Stern discusses in detail the use of hypnotic drugs in affections of the nervous system. The dangers of hypnotic drugs in many cases and the necessity for great caution in their use are emphasized. The papers are not suitable for brief abstract, but the following practical points may be noted. In the insomnia of neurasthenia the author recommends 3 grams of sodium bromide in a tablespoonful of fluid several hours before going to bed. The drug is given every evening for six or eight evenings and then discontinued for several days. Other suitable

drugs are adalin, 0.5 to 0.75 gram; bromural, 0.3 to 0.6 gram; and neuronal, 0.5 to 1 gram. Periodic discontinuance of these drugs is desirable. For the insomnia in anxiety neuroses a mixture containing codeine phosphate and sodium bromide is recommended, to be replaced later by veronal, luminal, or medinal. Often adalin, 0.5 gram two or three times a day, has a very good effect. In the insomnia associated with conditions of excitement in severe mental affections the author recommends scopolamin (hyoscine hydrobromide), maximal pharmacopoeial dose half mg. subcutaneously, but the dose may be increased to three-fourths mg. in strong adults with healthy hearts. Caution with respect to increase of the dose is necessary. As soon as possible the drug should be replaced by hypnotics given by mouth—veronal, luminal, trional, and (for choice) paraldehyde, the taste being disguised by raspberry syrup. In delirious patients hyoscine acts more promptly. In the insomnia associated with organic nervous diseases pain usually causes the sleeplessness, and antineuralgic medicines should be combined with hypnotics—such as salicylate derivatives with veronal, or the proprietary drugs known as veronacetin or codeonal. If the pain is very severe, pantopon injections should be given. In the insomnia of paralysis agitans hypodermic injections of small quantities of hyoscine tend to diminish the rigidity and paresthesia, and thus secure sleep.

Tompkins, E. SUPPLEMENTAL NOTES ON THE STAMMERING PROBLEM. [Journal of Abnormal Psychology, July-September, 1922, XVII, No. 2, p. 132.]

Tompkins discusses the theories of Ralph Reed in regard to stammering, and attempts to correlate them with Kepler's speech-interference hypothesis. The latter theory is to the effect that a temporary interruption of normal speech induces a conscious speech effort, which, for want of proper direction, blocks the automatic speech, creating a fear of further speech difficulty, which prompts further effort to overcome the imaginary difficulty, and intensifies the speech doubt. Contrary to Reed's view, Tompkins does not think that stammering begins with speech itself. The primary inhibition or interruption of speech may be so slight as to be overlooked in searching for the cause of the speech fault, but it always occurs after the habit of speech has been established. It may be a fall, a slight fright, tickling, or a more serious cause, such as a dog bite, or an illness. The intermittence of stammering proves that no primary lesion is responsible, but that the disorder is due to a vicious habit circle. Reed calls stammering a disease, a psychoneurosis, and a symptom of a general neurotic and introverted personality. However, the stammering does not arise from an inferiority complex or from introversion, but is, on the contrary, a cause of the self-consciousness, which, in turn, fixes the memory of the defect, and leads to the stammering habit. The fear of stammering leads to

a panicky misdirection of energy into the organs of speech, which overflows in uncontrolled muscular activity and interferes with speech. Tompkins disagrees with Reed as to the usefulness of psychoanalysis in such cases. Stammering is usually not based upon a complex, and therefore the detection of the cause of the initial interference with speech is of no assistance in overcoming the faulty habit. Stammering can be overcome only by substituting for the memory of successful speech. The more frequently the patient succeeds in speaking correctly the more sure of his ability he will become, and the greater will be his success in subsequent attempts at clear speech. Exercises and mechanic devices for diverting the excess energy from the organs of speech are of no avail. Only constant practice, encouragement, and unhurried attempts at clear speech will be successful. The stammerer should not be hurried or helped, but must be allowed to take his time and must be encouraged to talk under conditions which favor fluency. The associates of the patient must be patient, must not interrupt, and must allow him time to speak calmly. Difficult situations (such as asking for tickets) which demand quick speech, should be avoided until the patient is sure of his ability to speak fluently. The habit of correct speech must be carefully and gradually formed.

Chandler. THE CHURCH AND PSYCHOTHERAPY. [Ed. B. M. J., 1923.]

At the church congress held at Sheffield, Dr. Chandler, lately bishop of Bloemfontein, described the church system of therapeutics as consisting of the sacramental rites of confession, unction or the laying on of hands, and communion. Physicians had made the criticism that such healing was illusory and superficial, dealing only with symptoms and not penetrating to deep underlying moral causes. In many functional nervous disorders, there was an underlying moral cause, a repressed complex resulting from some moral struggle. He believed that the cause ought to be dealt with by a skilled confessor before the symptoms were touched at all. The priest in confession ought to be able to supply, with equal effectiveness and under more rigorous safeguards, the services which the psychanalyst strove to render. It was claimed that psychanalytic treatment differed from spiritual direction in securing a more complete and radical cure, so that repetition was not necessary. This might be true in the case of sudden violent and emotional shocks, in which the struggle between instinct and the ethical code had driven the instinctive reaction underground and produced a neurosis. In such cases, of which war shock was a typical instance, the reassociation or breaking into consciousness of the repressed complex might be all that was required. But, in the more usual cases, there was necessity for repeated treatment, in the way either of precaution or of cure, and this was best done by the sacrament of confession. Afterward, the

physical symptoms might well be treated more directly by the further sacramental rite of unction or of the laying on of hands. The reconsecration of the body to the Divine which was thus effected came as a natural and proper sequel to the absolution previously received. Finally, the whole nature of the man was strengthened spiritually and bodily, and built up by the sacrament of communion.

Pilcz, A. COMPULSIVE IDEAS AND PSYCHOSIS. [Jlb. f. Psych. u. Neur., Vol. XL, Nos. 2, 3.]

Pilcz emphasizes the necessity for a sharp distinction between the true compulsive neurosis according to Kraepelin and the symptomatic compulsive ideas. Careful analysis should be able to differentiate between them where the latter are associated with paranoia and paranoid schizophrenia. Where the compulsive ideas are present as an accompanying symptom of a manic-depressive psychosis hereditary conditions should be taken into consideration.

Marie, A. THE MENTALLY SICK IN EGYPT. [Bull. d. l'Acad. d. Méd., LXXXVIII, No. 34.]

The study of the psychoses in Egypt during the past thirty years, according to this author, shows that the Arabs are subject to the same types of mental disease as seen elsewhere in the world. General paresis was definitely diagnosed for 0.55 per thousand population; this would reckon out about 1,000 cases during the thirty years in a population of thirteen million. Infantile paresis cases have been seen, and also pluriconjugal neurosyphilis from polygamy is not infrequent while neurosyphilitic manifestations of various types are frequent. Pellagra and hashish are responsible for a large number of toxic psychoses. They occupy a relative position to the alcoholic psychoses of northern races.

Fausser and Heddaeus. ENDOCRINE GLANDS IN MENTAL DISEASE. [Klinische Woch., Feb. 18, 1922, Vol. I, p. 374.]

In this pathological study of general findings, without careful clinical analysis of twenty-five patients, the suprarenals, thyroid, hypophysis, gonads, thymus and the pineal were studied. The general types of case were as follows: Seven dementia precox, twelve epileptics, five imbeciles and one a senile dement. In general the thyroid showed frequent goitrous degeneration. The suprarenals showed senile in part and findings due to tuberculosis. In various psychoses in the hypophysis a predominance of the basophiles over the eosinophiles in the anterior lobe, which showed the authors prematurely assume is a condition opposite to normal findings. The gonads, the thymus and the epiphysis showed no typical changes. Thus they apparently missed the almost universal findings that Lewis has shown to occur in the precox group. On the whole an unsatisfactory study.

BOOK REVIEWS

Tilney, Frederick, and Jelliffe, Smith Ely, Editors. SEMI-CENTENNIAL ANNIVERSARY VOLUME OF THE AMERICAN NEUROLOGICAL ASSOCIATION. 1875-1924. [American Neurological Association, 1924.]

The American Neurological Association held its semi-centennial in Philadelphia in 1924 under the presidency of Dr. Chas. K. Mills. It was a noteworthy occasion and its proceedings are recorded in the Transactions of that year.

One of the achievements of this meeting was the preparation and presentation of this Semi-Centennial Anniversary Volume, which was made possible by a number of the members of the Association, chiefly Dr. Tilney, and then brought into the present publication by Drs. Tilney and Jelliffe.

It makes a noteworthy record of the achievements of this Association in a well prepared large octavo volume of 650 pages. Dr. J. Ramsay Hunt contributes a short opening chapter upon the foundation of the Association with a brief appreciative note of Beard's signal contributions to psychopathology. Dr. Chas. K. Mills follows with an entertaining series of personal reminiscences of the earlier meetings and of the older members of the Association, such as Jewell, Seguin, Webber, Edes, Putnam, Spitzka, Wilder, and others. He groups the activities of the Association into periods and outlines its structural growth in a most pleasing and intimate manner. Here is a bit of personal history to be highly prized.

In Chapter III we find collected short biographical sketches, with portraits, of all of the Presidents of the Association. It must have been a difficult task to get this material together, but Dr. Tilney succeeded most admirably. Then the members of the Association are similarly biographically pictured. Altogether the personnel of this Association has received an admirable description. Here is a Neurological Who's Who that really means something.

Dr. T. H. Weisenburg next gives an interesting résumé of the military activities of the members of the Association, and after an interesting chapter which reproduces all of the "Programs," Dr. Jelliffe presents a review of "Fifty Years of American Neurology." This is the first time in the literature of this country that such an attempt has been made, and we hope Dr. Jelliffe will some day complete this "Fragment," as he calls it, as he can then contribute a classic to the history of American neurology.

The History of the Constitution and By-Laws is then given, and then follow 200 pages of bibliographies of the studies contributed by the members of this Association.

This is a work which should be in every medical library in this country as a record of what American neurology has accomplished in the brief fifty years of its existence. It is truly an achievement of which its members may justly be proud.

Hoffmann, Paul. *UNTERSUCHUNGEN ÜBER DIE EIGENREFLEXE (SEHNENREFLEXE) MENSCHLICHER MUSKELN.* [Julius Springer, Berlin.]

A short, clear, and well written study of the tendon reflex phenomena as investigated through mechanical or electrical stimulation, or special accessory methods to these.

The nature of the tendon reflex in precise terms of nerve impulse income and outgo is well set forth. The author finds no evidence for antagonistic innervation of voluntary muscles, but otherwise no striking variations from accepted teachings are set forth.

Kehrer, Ferdinand, und Kretschmer, Ernst. *DIE VERANLAGUNG ZU SEELISCHEN STÖRUNG.* [Julius Springer, Berlin.]

The authors presented at the 1923 meeting of German psychiatrists a "Referat" which sought to more accurately define modern conceptions concerning "Disposition" to disease and "Constitution" as a physiopathological formulation.

The large and important series of problems concerning the causation and structural characteristics of mental disturbances in the light of modern movements in psychopathology was the object of their report, which is here presented as Vol. 40 of the Springer Monograph Series on Neurology and Psychiatry.

What is meant by "Veranlagung" or "Disposition" to disease which has heretofore been a hazy conception? The authors discuss the modern hypothesis of Kraepelin, Mayer, Birnbaum, Jaspers, etc., etc.; also the ideas of Grote, Kahn, Siemens, Rössle, Brugsch, Pfaundler, Kraus, Martius, and others, as to what is meant by "Constitution." They are inclined to favor Siemens' general formulations.

Constitutional pathology still remains but a handmaiden of Disposition pathology. By "disposition" is meant the specific readiness to acquire definite disease processes, in which hereditary and psychophysical factors are dually involved.

They attempt a scheme of the "normal psychophysical development of the 'Person,' *i.e.*, what has been so often here emphasized, before and after Kraus, of the "Organism as a Whole." So much for their "General Considerations." Then follow "Special Considerations" in which Kehrer first takes up the "Disposition" to develop "Symptomatic Psychoses," "Generative Psychoses," and "Operative Psychoses." Why do certain syphilitics develop paresis? This is discussed along very formal lines. The background of the Psycho-neuroses and Psychogenic Psychoses is then taken up. Here the authors cannot avoid the "Deeper Psychology" of Freud, Bleuler, and others, although it cannot be said that the discussion really shows any comprehension of the intrinsic significance of the libido theory;

in fact, the whole discussion deals with the subject at very superficial levels. Similarly the treatment of the problems of delusional formation and the nosological groups of Dementia Precox and Manic-Depressive Psychoses.

In spite of the effort to obtain a fundamental platform of the organism as a whole in its biological and energetic transforming goals, we find much interesting discussion of many of the current hypotheses but little monistic generalization capacity.

The monograph is notwithstanding most informing and interesting and deserves a wide reading.

McBride, P. *PSYCHO-ANALYSTS ANALYSED.* [William Heinemann, London. 3/6.]

If this book were entitled "Some Random Shots at Psychoanalysis" it might prove quite amusing to practical psychiatrists to know something of psychopathology at first hand. As it is, it will be found quite satisfying to many who, in the manner of Old Ekdal in Ibsen's *Wild Duck*, shoot imaginary rabbits with imaginary blunderbusses in an imaginary forest.

The author tells us he has retired from practice and has taken up some reading of psychoanalytic literature. Hence his preconceptions, prejudices, and illusions about a definitely practical series of issues that can only be tested by work in the actual field. It is another of the literary table criticisms that are beautifully constructed but have little to do with the actualities of the material under survey.

Timme, Walter. *LECTURES ON ENDOCRINOLOGY.* [Paul B. Hoeber, New York.]

This small brochure is not correctly titled, since it is a reprint of an interesting paper published in the *Neurological Bulletin*, which in turn was made up of some minor papers previously published in other journals. It is a most valuable discussion of certain compensatory activities which take place on the basis of endocrinological defect states. It is a purely descriptive presentation containing much thorough observation and some fascinating speculations.

Singer, H. Douglas, and Krohn, William O. *INSANITY AND LAW. A TREATISE ON FORENSIC PSYCHIATRY.* [P. Blakiston's Son & Co., Philadelphia.]

This is a difficult book to judge, it has so many excellent features and yet misses being a very superior contribution by the use of inexact formulations and the confusion of conceptions which modern psychopathology has been endeavoring to make clear and valuable for the handling of practical issues, not only within the field of psychiatry itself but in its borderland applications in social hygiene and in jurisprudence.

The authors had an excellent opportunity to clearly define what mental disorders are in modern formulations and an equally important obligation to show what legal machinery had to do with those instances where, by reason of mental disorder, problems of responsibility, of contract capacity, and related issues were involved.

Although the book is quite readable and will be useful, the failure to present these issues as clearly as might be wished constitutes a serious drawback to its being regarded as authoritative.

We chiefly regret the confusion regarding the "insanity" concept. When the dense and heavy Romans became dissatisfied with what they called Greek subtleties, for the Greeks were the greatest analyzers of their times, they tried to sweep away all distinctions between definite behavioristic patterns, to which the keen minded Greeks gave different names, and in true lazy proletariat fashion called them all by one name—"insania." This term, as well as the false synthetic concept, has stuck in legal terminology until the present day, and is reiterated in this would-be up-to-date treatise. The "Classification of the Insanities" is the chapter which reemphasizes this old befuddling notion. Modern concepts recognize the legal term *as a legal term*, and nothing more. A social fiction and not a medical idea. If one should really attempt to classify the "insanities" one should have to separate the different definitions of the different state legislative rules and regulations about issues of criminal responsibility, contract capacity, testamentary capacity, etc. This would constitute a classification of the "insanities." Thus as a part of the scheme one would have to separate the New Jersey test of criminal responsibility, on the basis of "a knowledge of the rightness or wrongness of an act, and the ability to control an impulse," from the New York definition of "insanity" in respect to a "knowledge of right and wrong alone." Again, in New York an individual is "insane," with reference to the question of his ability to confer with defending counsel, if he is an "idiot or an imbecile only." And still again he is "insane" if, respecting testamentary capacity, he "does not know the nature or kind of his property, nor the natural objects of his bounty," and so on and so on. In one state he is "insane," in another he is "sane," and yet the same individual is involved and the same issues are at stake.

Hence the urgent need and the imperative obligation of anyone to-day writing upon medicolegal matters to clearly define the issue that "insanity" is solely a legal formulation and should not be confused with medical syndromes in the psychiatric field.

This fundamental distinction we maintain the authors have utterly failed to comprehend, much less to more than gloss over with a few meaningless apologies concerning the difficulties of separating the "insane from the sane."

In general, it is too good a book to be made a "gel" produced by the confusion of such clearly stateable separate modes of approach.

We trust that a future edition will clear up these issues, for there is much good material here.

Galloway, T. W. *SEX AND SOCIAL HEALTH.* [American Social Hygiene Association, New York.]

This rather large book is intended as a manual of sex education for all classes of intelligent people who have come to recognize the transcendent importance of the "Creative Principle" in life, call it

by all or any of the names which have been used down through the ages.

It is a very excellent manual in most respects. It is needlessly wordy and at times borously repetitious. This is due in large part to the fact that although the author grasps many of the conscious aspects of the sex problem, he has little insight into unconscious factors and their manifestations. Could he have combined these better he could have shortened the work and weeded out much useless verbiage.

For the most part sound, he is distinctly uncomprehending in many places. We choose only one of these, and that deals with the subject of masturbation. He is quite old fashioned in his discussion and advice and utterly fails to realize the enormous importance of this "physiological phase" in all human evolution. Had he a better knowledge of psychopathology his chapter would be more helpful and practical.

Fabritius, H. ZUR KLINIK DER NICHTPARALYTISCHEN LUES-PSYCHOSEN. [S. Karger, Berlin.]

In this number 24 of Bonhoeffer's "Abhandlungen" may be found an excellent orientation to the developing conceptions regarding non-paretic syphilitic psychoses, first specifically thrown into acute discussion by the work of Plaut (1913) just over a decade ago.

Here may be found an excellent résumé of the chief work, principally of the descriptive psychiaters, in which exogenic and endogenic factors, principally the former, are accented. In the author's discussion of Kraepelin's one dimensional, Körtke's two dimensional, and then Kretschmer's polydimensional psychiatry, we obtain an inkling of the difficulties involving all such descriptive psychiatric conceptions which fail to give sufficient accent to the "deep" endogenous factors, made prominent first by Freud and Bleuler and in more recent years by Schilder, Stürcke, Hollos, and Ferenczi, and others.

For a lucid outlining of the narrower clinical conceptions we know of no recent work which can orient the student so well as this one; as such it is a notable and worth while contribution, and no matter what special group with which the reader may affiliate his formulations this work will provide excellent psychiatric observation material.

Kafka, Gustav. HANDBUCH DER VERGLEICHENDE PSYCHOLOGIE. Zweite Band. DIE FUNKTIONEN DES NORMALEN SEELENLEBENS. [Ernst Reinhardt, München.]

The first volume of this large and important enterprise has been favorably commented upon in these pages. The second volume here presented supports the high opinion expressed concerning its predecessor.

Here are set forth monographic discussions of (1) The Psychology of Speech, by Hermann Gutzmann; (2) The Psychology of Religion, by Georg Runze; (3) The Psychology of Art, by Richard Müller-

Freienfels; (4) *Social Psychology*, by Aloys Fischer, and (5) *Occupational Psychology*, by Otto Lipmann.

In the true spirit of the ancient sophist, dynamic philosophy, which has come to striking prominence in modern times, Gutzmann defines speech as a type of behavior serving for the freeing and discharge of inner tensions. As an expression of internal processes to the environment may be seen its secondary importance. Both together indicate its significance as a form of social binding which in a general sense may be considered of primary importance. Perception of that which is spoken, as well as the inner significance of the need of expression, go hand in hand even if the recognition of the former precedes the development of the latter in the actual ontogenesis of speech in the child.

With such a sound program who can but be in sympathy, and its development receives our heartiest commendation, even though some of the earlier phyletic evolutions of speech mechanisms, biologically considered, are left untouched.

With the chapter on Religious Psychology the reviewer feels incompetent to deal. Although in general an adherent of the general conceptions set forth by Rank, Frazer, Stanley Hall, and the genetic school, we are fully aware that here is a complex subject which requires an almost superhuman capacity to adequately portray. Lacking that grasp, the reviewer can but state that he has found this admittedly short sketch most intriguing and illuminating, especially as the author has been catholic in his exposé and not doctrinaire.

The largest and fullest chapter deals with the psychology of artistic expression. "Kunst" is also a form of "doing," a behaviorism, and this again entitles its treatment to sympathetic appraisal. Music, the dance, rhythm, poetry—epical and lyrical—drama, the arts of construction, building, ornamentation, sculpture, drawing, painting; these titles but fragmentarily indicate the rich material here woven into a story of fascinating interest.

And so we might go on with the two remaining chapters dealing with social and occupational psychology, two new fields in which the general genetic and behavioristic attitudes promise much for the psychological discipline of the future.

We can in closing but repeat our initial impressions: Here is a work of much value and significance for all students of human behavior.

Brink, Louise. *WOMAN CHARACTERS IN RICHARD WAGNER.* [Nervous and Mental Disease Publishing Company, New York and Washington. \$2.00.]

In season, we hope, and frequently, we fear, out of season, a certain acerbity has tintured these pages relative to the acidulous reception of psychoanalytic works by orthodox university authorities. Here we have the opportunity to make an "amende honorable" for the present most estimable work bears the authority of a Ph.D. thesis under the aegis of the Germanic Department of Columbia

University, and, we are glad to state, does credit to both author and university authorities.

Dr. Brink has given us one of the most scholarly and illuminating studies of an artistic genius, Richard Wagner, and chiefly through the psychoanalytic mode of approach. Not only is it most charmingly written, sympathetically interpreted, esthetically treated, but scientifically justified.

Among the recent contributions to the psychoanalytic interpretations of artistic productivity we find this work ranking with the best. There is not the slightest intimation of maudlin sentimentality in Dr. Brink's pages, but a most high-minded and thorough handling of her theme which reflects great credit upon her scholarship and literary ability.

We have read it with fascinating interest, and although the Wagnerian literature is almost colossal in its mass this monograph we deem one of the best thus far produced.

Ziehen, Th. LEITFADEN DER PHYSIOLOGISCHEN PSYCHOLOGIE IN 16 VORLESUNGEN. Zwölfte umgearbeitete Auflage. [Gustav Fischer, Jena. Mk. 18.]

What remains for a reviewer to say about a work which has appeared in twelve editions? The support of a public which has requested such a guide indicates only too definitely that this is a valuable work.

The reviewer has always admired the author's almost transcendent scholarship. We are intimately acquainted with his early work, his classical contributions to Bardleben's "Anatomie," in its chapters on the "Nervous System," and his many neurological monographs; his "Psychiatrie," a trifle formalistic, but, as Adolf Meyer has shown us, a work of real merit; his many contributions to neurology and to philosophy, all stamp the author as possessing talents of the first rank which in this physiological psychology are quite evident.

No work in this field affords so much material carefully digested and brought up to date. We recommend it to our readers interested in its particular domain.

Freud, Sigmund. UEBER PSYCHOANALYSE. Siebente, unveränderte Auflage. [Franz Deuticke, Leipzig und Wien.]

These five lectures given by Freud at Clark University in 1909 here appear in a seventh unaltered edition, an evidence of their enduring interest.

Weil, Arthur. THE INTERNAL SECRECTIONS. Translated by Jacob Gutman. [The Macmillan Company, New York.]

There are many works upon endocrinology, mostly large tomes, some small. The present work is one of the smaller ones, but it is not only quite original but suggestive. The "incretions" are considered from a new point of view, namely, as they enter into and influence the general functional activities of the various physiological

systems. Here is no striving after a pseudo-syndromy of this or that gland, but rather an effort to show the rôle played by the hormones on blood physiology and circulation, upon respiratory and voice activity, upon various metabolic activities, upon growth and bodily form, and upon the reproductive system and its physiology.

It is a highly satisfactory work.

DuBois, Eugene. BASAL METABOLISM IN HEALTH AND DISEASE. [Lea and Febiger, Philadelphia and New York. \$4.75.]

The study of the human machine as a device to capture, transform, and deliver energy has more and more engaged clinical medicine, and that aspect of energy transformation which is broadly formulated as metabolism has been most enthusiastically analyzed so soon as the rationale of simpler biochemical processes was grasped.

This volume presents an extremely valuable summary of certain of these transformation processes, and a thoroughly satisfactory statement so far as the metabolist can see it. Here are recorded the efforts at measurement of vital processes in terms of the energy transformations of a few of the chemical substances of the human body.

Biochemical science has not yet been able to grasp and understand the energy transformations of many of the twenty-eight chemicals which have been integrated into the human body, but it has done excellent service in getting at some fundamental conceptions concerning a few of them, notably carbon and oxygen.

This book gives an excellent orientation towards these limited activities. As the author reminds us in his opening paragraphs that many of the earlier workers gave us 90 per cent misinformation and 10 per cent of truth, we can only hope that the present formulations may share a slightly better percentage of residual verity. In a sense it is to be regretted that the students of metabolism have been so cocksure in their manipulation of figures. Figures are no more certain of being rock-bottom certainties than some of the wildest speculations. The seeing mind and the measuring mind are often too widely separated. Science demands their judicious combination.

This is an excellent type of work showing the great values of the measurement aspects of medicine, and it is particularly praiseworthy as exemplifying this type of research at its best.

Aschaffenburg, G. DAS VERBRECHEN UND SEINE BEKÄMPFUNG. Dritte verbesserte Auflage. [Carl Winters Universitätsbuchhandlung, Heidelberg.]

As an introduction to criminal psychology for physicians, jurists, and sociologists, this work has stood the test of two previous editions. The author deals with his subject matter in three general sections: (1) General Causes of Criminality; (2) Individual Causes, and (3) Methods of Prevention.

Among the general causes he discusses seasonal influences, racial and environmental factors, town and country occupations, alcohol and other narcotics, prostitution, amusements, kinema and obscene literature, superstition, economic situations, crises and wars.

Among individual factors he deals with heredity and training, school life, age, sex, family situations, lombrosos ideas, bodily characteristics, psychological characteristics, mental disorders and classification of types.

Under Preventive Measures he discusses the general aspects of present day criminality, temptations, responsibility, punishments, modified sentence, the training of jurists, treatment of juvenile criminals, treatment of mentally disordered criminals, habitual drunkards.

This list of chapters gives but a faint idea of the many useful and sound pages of discussion in this excellent monograph. Only in one respect we miss something in its general trends and that is an absence of the conceptions of the "unconscious" as developed in modern psychopathology.

Kammerer, Paul. REJUVENATION AND THE PROLONGATION OF HUMAN EFFICIENCY. [Boni and Liveright, New York.]

A popular exposition of the Steinach operation from a biological viewpoint, mingled with a certain amount of surgical propaganda.

Cum grano salis—an excellent work which deals with a subject of much exaggerated as well as real importance.

Roger, Henri, et Aymés, Gaston. DIAGNOSTIC ET TRAITEMENT DES SCIATIQUES. [A. Maloine et Fils, Editeurs, Paris.]

The authors, respectively Professor and Chief of Clinic of Neurology in the Medical School of Marseilles, have here written a small but intelligent brochure upon this most important neurological problem of sciatica. They first discuss quite fully the various major and minor signs of the syndromy which permit a methodical differentiation of the simulated or exaggerated sciaticas, the false sciaticas, pains due to implication of other than the sciatica, the parasciaticas, those due to neighboring structure changes impinging upon the sciatica, toxic and infectious sciatic neuralgias and neuritides, and finally the spinal and radicular sciaticas.

Treatment adapted to meet these issues is admirably outlined.

Kraus, Friedrich, u. Brugsch, Th. SPEZIELLE PATHOLOGIE UND THERAPIE INNERER KRANKHEITEN. Vol. X, 3 Theil. [Urban und Schwarzenberg, Berlin u. Wien.]

Part three of this system opens with a most illuminating and thorough chapter by Kurt Dresel on Diseases of the Vegetative Nervous System. It is the most philosophically treated monographic presentation of this important section of nervous disorders which has come to the reviewer's desk.

It is followed by a chapter on Hysteria by Kutzinski of Königsberg which is conscientious and but fairly satisfactory. Ewald Stier of Charlottenburg contributes an excellent chapter upon Neurasthenia, though conceived a bit too narrowly in "Beard's" sense. He also deals with the Traumatic Neuroses, in which he dodges the whole problem of narcissistic regression which is so prominent in this special type of reaction.

W. Alexander writes upon the Occupation Neuroses entirely on

the descriptive level. Max de Crinis has a very carefully written chapter upon Epilepsy, with much interesting biochemical material. Kutzinski writes the chapter upon Compulsive States, which does full justice to the situation up to where Freud took up the problem. Into this the author is plainly not competent to enter, as he shows in his chapter upon hysteria.

Richard Freund has an excellent chapter upon the Gestation Toxicoses, a highly intricate and as yet incompletely analyzed medley of problems. The Chronic Toxicoses are dealt with descriptively by Schroeder of Greifswald. Cassirer and Hirschfeld write a valuable monograph on the Vasomotor-trophic Disorders along the lines of the senior author's well known presentation.

Chapters on Paralysis Agitans and Chorea by Lewy of Berlin are exceptionally fine and present these questions quite up to the most modern standards; in fact, are original and highly suggestive.

This whole volume is of exceptional value to the neuropsychiatrist even though the handling of the psychogenic disorders leaves much to be desired in modern day psychopathology.

Buzzard, Bristow, Greenfield, Head, Riddoch, Sargent, and Trotter. II. INJURIES OF THE SPINAL CORD AND CAUDA EQUINA. [His Majesty's Stationery Office, London. 1/6.]

The Committee upon Injuries of the Nervous System, whose names are here given, present this report. They discuss the anatomy and applied physiology of the cord, methods of examination, diagnosis of injuries, pathology of cord injuries, treatment of injuries of the spinal cord, and prognosis, and in part 2 take up the Cauda Equina.

Here is a short, precise and concise, and valuable contribution to spinal cord injuries based upon World War material.

Haldane, J. B. S. DAEDALUS OR SCIENCE AND THE FUTURE. [E. P. Dutton & Company, New York.]

One may read this book in a half hour and lay it down. One will not get away from it in many a day. Its challenge is more than a sharp summons to a quick, decisive battle. With a daring that draws thought into wide unknown areas, the author opens up suggestive possibilities that lie in the constructive opportunities of science. That is, such opportunities are posited before minds slowly unfolding before the fields into which science, hardly aware of itself as yet, has the ability to enter. The individual possibilities here, most of all in those fertile but still latent territories of science, biology, and psychology, rouse our minds to face new conceptions of things, to penetrate beyond the confines in which we have guarded our now classic formulas. Einstein is, to the author, the outstanding figure who has here pointed the way. Esthetics and morals, too, must change; but so have they in the past, and we had overlooked or forgotten it. The challenge is broad; the way, even to the author's free vision, is uncertain. Yet its alternative, possibly even one of the routes of success, is the overwhelming of present civilization through this same scientific capacity.

OBITUARY

BURT GREEN WILDER, M.D.

Dr. Burt Green Wilder died January 21, 1925, at the age of eighty-three years. He was the seventh president of the American Neurological Association, and throughout a long and active life was vigorously interested in the forms and functions of the nervous system. He was one of the most prolific writers upon anatomical subjects in the United States.

Dr. Wilder was born in Boston in 1841, attended the Brookline High School, Dartmouth, and Harvard, taking a B.S. and an M.D. at Harvard in 1862 and 1866, respectively. While a student he served in the Civil War. Later he began his zoölogical work as a herpetologist and a teacher of natural history. He taught physiology in the Medical School of Maine, 1875-1884, and was for many years active at Cornell University in the anatomical, zoölogical, and neurological departments. For some years he labored to modify the terminology of neuroanatomy with varying degrees of success. The excellent work of comparative neurology of the Cornell group was mainly due to the enthusiasms of Wilder and the Gages.

Dr. Wilder had three children by his first marriage. A second wife died in 1922. He was an excellent musician and a composer. A fairly complete bibliography of his more important contributions to neurology may be found in the Semi-Centennial volume of the American Neurological Association.

NOTES AND NEWS

FELLOWSHIPS IN NEUROPSYCHIATRY, UNIVERSITY OF PENNSYLVANIA

Five fellowships in neuropsychiatry are available in the Graduate School of Medicine of the University of Pennsylvania. These fellowships have been established for the period of three years from October 12, 1925, by the Commonwealth Fund of New York.

No definite fellowship stipend has been fixed; but it will in each case approximate \$2,200 per annum. The precise stipend will in each case be designated by the fellowship committee.

The minimal qualifications for applicants are: (a) age, from twenty-five years to thirty-five years inclusive; (b) graduate of a Class A medical school; (c) one year's approved internship; (d) satisfactory references; (e) approval of personal and professional status.

Applications are invited for these fellowships and should be addressed to "Dean, Graduate School of Medicine, University of Pennsylvania, Philadelphia."

N. B.—All business communications should be made to Journal of Nervous and Mental Disease, 64 West 56th St., New York.

All editorial communications should be made to Dr. Smith Ely Jelliffe, Managing Editor, 64 West 56th St., New York.

The Journal OF Nervous and Mental Disease

An American Journal of Neuropsychiatry, Founded in 1874

ORIGINAL ARTICLES

COMMENTS ON THE PATHOLOGY OF DEMENTIA PRECOX

BY NOLAN D. C. LEWIS, M.D.,

CLINICAL PSYCHIATRIST, ST. ELIZABETHS HOSPITAL, WASHINGTON, D. C.

We are confronted at the outset by a very formidable difficulty, which psychiatrists, other clinicians and pathologists have been trying to solve for a number of years. The difficulty is the lack of uniformity in the concept of dementia precox, and so disorderly is this group and so remote from being the disease entity hoped for and outlined by Kraepelin that one is able to discover the greatest diversity of mental reaction types placed in this category, in nearly all mental disease hospitals. In fact the present status of dementia precox is similar to the former state of the concept of neurasthenia, which was a mass term for a multitude of obscure conditions, before Freud differentiated true neurasthenia from the exogenous forms. The term schizophrenia which is descriptive of the principal mental mechanism in dementia precox has become equally meaningless from a practical standpoint, not only because it has in some psychiatric centers become synonymous with "dementia precox," but also its adoption has led to the inclusion of types too diverse to be thus united.

The above clinical situation has rendered conclusive or even comprehensive anatomical, physiological, or chemical investigations practically impossible, and any attempts in these fields have naturally and deservedly aroused much critical comment. In fact there are several authorities who believe there is nothing to be gained by such researches since they are satisfied with mental mechanistic explanations;

however, some of us are still searching for other aspects of the total reaction, and believe that consistent effort will reveal basic correlations and integrations in the structural and chemical realms of the various reaction types.

Speaking from an evolutionary standpoint there can be no separation of function and structure, each in a way depending on the other, as Child (1) has so aptly put it: "The relation between structure and function in the organism is similar in character to the relation between the river as an energetic process and its banks and channel"—"The river is neither the water current nor the channel. It is both of these as they have developed together and the only way the river can be fully understood is by consideration of it as process." (2) Bumke (3) believes that certain investigations on constitutional differences have a tendency to underestimate the exogenous factors in schizophrenic syndromes. If Bleuler finds schizoid indications in everybody according to Bumke he simply substitutes the term "schizoid" for man without proving anything except the presence of some general human traits in schizophrenic patients. He also believes that some of Kretschmer's supposedly schizoid types such as the "cold aristocrats," "pathetic idealists" and "cold despots" are simply healthy and in no way in temperament akin to dementia precox. On the other hand if a person is oversensitive and at the same time cold without pretending coldness as a mask, or obstinate or suddenly impulsive, he cannot be considered as a variety of normal, but simply as pathologic. This may be an abortive form of schizophrenia. There is something wrong with the whole structure of the conception of dementia precox.

There is so much overlapping and admixture of symptoms in the ten descriptive types of Kraepelin (4) that we have not been able to use this classification as a working basis for determining the constitutional make-up.

He differentiates (a) dementia simplex which corresponds to his former group of the same name, (b) foolish dementia corresponding to the hebephrenia of Hecker, (c) simple depressive or stuporous dementia including a few so-called hebephrenics and many of our catatonics with depressive stages—a condition characterized by a preliminary stage of peculiarities and brooding, often lasting for years with recurrent attacks and gradually drifting into severe dementia. In about twenty per cent ideas of sin—persecution and catatonic symptoms appear, (d) depressive dementias with bad prognosis and characterized by conspicuous chronic delusional formations, (e) circular forms with excitement alternating with depressions

and leading to severe dementia, (f) the agitated form with continuous excitements, compulsive acts, senseless movements and exalted moods, the most frequent form noted by Kraepelin among the natives of Java, (g) periodic confusion with attacks of confused excitement beginning and ending very acutely, lasting only a few weeks and combined with marked loss of weight. In females this is not rarely associated with menstrual periods, (h) typical catatonia, (i) the paranoid forms, emphasizing the dementia paranoidis gravis with loss of external bearing, disturbance of feeling and will, and severe decay of psychic life—then the dementia paranoidis mitis with hallucinations in the foreground but less fundamental personality disturbance than in the former and finally (j) the speech confusion or schizophasia type which runs a course of very severe speech disturbance sometimes amounting to complete “word salad” and at the same time showing relatively slight impairment of the other faculties and remaining capable of work in the hospital environment for many years.

Bleuler (5) said in 1915: “Many think they are turning against me when they say physical changes lie at the bottom of the group (dementia precox). I, myself, have expressly emphasized this fact. One must acknowledge that at least the great majority of clinical pictures which are now collected under the name dementia precox rests on some toxic action or anatomical process which arises independently of psychic influences—that such groups (those arising from psychic causes) exist is yet to be proved, while the principal group in my opinion is certainly caused by organic changes.”

Claude and Brousseau (6) have recently protested against including two main reaction types under the broad expression “dementia precox.” They insist on distinguishing these two principal types as (a) the type of simple, puerile degenerative, self-absorption with mental enfeeblement of emotional nature and (b) the type consisting in complicated ideational delusions, illusions and hallucinations with retained but dislocated mental activities. These authors are certainly justified in their belief that it is to say the least confusing to deal with such diverse reactions under the same descriptive heading. Adolf Meyer (7) has been somewhat more definite in his formulations of the mental reactions in schizophrenia, but emphasizes that “no one would dare to make a diagnosis from samples of the nervous system.” He calls attention to Greenacre’s (8) excellent formulations of schizophrenic reaction characteristics which may be reviewed here with profit.

1. Distortions and misinterpretations of actual occurrences (delusions of reference and persecution).
2. Influence and passivity feelings as expressed in automatism, mind-reading, electrical influence and similar phenomena.
3. Hallucinations (especially when vague and of more or less odd and incongruous content).
4. Gross distortions of body sense and body appreciation.
5. Incongruous behavior occurring either episodically as "antics" or more persistently (as ill-connected mannerisms) but not in keeping with or apparently motivated by any prevailing affect.

If we have now satisfactorily directed attention to the fact that the schizophrenic or precox classifications are not consistent, before proceeding farther with the present discussion it may be desirable to present some of the recent evidence bearing on the heredity in precox states. Rüdín's (9) well known study of heredity in precox is criticised by Bleuler as being too rigid and failing to include many larvated or undeveloped cases that never get into institutions, at any rate his results are extremely hard to interpret and are not conclusive as to the nature of the thing inherited.

The family described by Smith (10) indicated the working of Mendelian laws in that the father of this family committed suicide during a typical depression and the mother died twenty-eight years after commitment for dementia precox. The two sons had dementia precox and one daughter committed suicide by drowning, at the age of thirteen. The second daughter had been under treatment on two occasions for manic-depressive psychosis, but later recovered and has supported herself apparently normally for fifteen years—the publications of such observations should be encouraged. The evidence that dementia precox may be an heredo-degeneration similar in mechanism to the hereditary ataxias, muscular dystrophies and choreas, has been discussed by me at the 1923 meeting of the Association for Research in Nervous and Mental Diseases (11). In fact these diseases and dementia precox have shown various combinations in the same family. As one of the reported instances of this we may quote Krabbe (12) of Copenhagen who describes three sisters with schizophrenia and myoclonus. The family was Jewish and eminent in commercial life, the father married his cousin and her mother also belonged to the same family. There were three out of twelve with dementia precox in the second generation and six out of twenty-four in the third generation including the three sisters with myoclonus, however, the fourth generation has twenty-seven members all normal to date. In this family dementia precox

seems to be a recessive Mendelian quality. Dementia precox as a type of heredo or progressive degeneration has recently been discussed by Mollweide (13) and also by Alford (14) who feels that there is evidence of inheritance in the anatomic findings, that its chronic course and deterioration indicate a structural basis which may be a destruction of some unitary nervous function. He points out the existence of about eighty varieties of progressive degenerations some of which select for attack only one or two nervous structures and cease when they are destroyed, and classes dementia precox among these degenerations, assuming its localization to be at the higher levels.

In my 1923 article above cited I assumed the true dementia precox constitution, as I understand it, to be an heredodegeneration whose localization was not at the higher neurogenic levels, but consisted of a defective factor outside the neuroectoderm with the primary focus located in "those primitive cells the later differentiation of which produces the mesodermal and entodermal structures." "The factor or factors inherited may represent a general instability of integration with varying degrees of resistance to the environmental load. There is considerable evidence to indicate that this constitutional factor of degeneration operates more precisely in the circulatory and endocrine systems."

Neuropathologic studies of the central nervous system in cases of precox, paranoia and manic-depressive types have failed in the past to disclose any lesions which may not be interpreted as secondary in nature, that is produced by general metabolic disturbances or by intercurrent diseases, but let us review and comment upon a few of the most informative of these investigations.

In 1897 Alzheimer (15) stated that severe changes with disorganization were found in the ganglion cells with tendencies to swelling of the nuclei, folding of the nuclear membrane and severe shrinking of the protoplasm, sparing mitoses in the glia, and a surrounding of the nerve cells by pathological formations of glial fibers. Cramer (16) then reported a case in which practically every nerve cell was pathologically altered. The findings of these two observers were either confirmed or added to by Dunton (17) in 1902; Laignel-Lavastine (18) in 1904-05; Klippel and Lhermitte (19) in 1905, and by Mondio (20) in the same year. Lhermitte separated the lesions found into fundamental or primary and secondary or accidental lesions caused by the lethal disease. He considered as fundamental the progressive atrophy of the nerve cells with dropping out of the dendrites thus breaking the synapsis of the neurons. In 1909 Scioli (21) worked up the brains

from twenty cases of dementia precox. I quote his findings as outlined by Gurd (22) who has given a short but concise summary of the histopathological findings in an article on the structural brain lesions of dementia precox. (a) "A loss of nervous elements in all parts of the brain, general degeneration of the nerve cells with increase in fat, the degeneration leading to a slight thinning of the cell layers at times, (b) zones around vessels free from nuclei but filled with degenerated masses, (c) degeneration products in the adventitial lymph spaces and in the nervous tissue, no inflammatory exudate. Nerve fibers often intact where the nerve cells show severe injury and glia proliferation in the molecular layer. Sixth layer and medullary areas and around vessels, sometimes with amoeboid cells."

Many notable investigations have been carried out since 1909, the more striking among them being the well known work of Southard's (23), Cotton's (24) work on fatty deposits, Moriyasu (25) in 1909, Wada (26) in 1910, Nissl (27) in 1914, Zimmermann (28) in 1915 and in 1920 by Rawlins (29) who studied twelve cases showing uniform pathological changes which were not considered to be due to arteriosclerosis, senility or a continued severe toxic process. Her summary is "The pathological process is essentially a chronic one resulting in an atrophy of the nerve cell body and nucleus, a disappearance of its stainable substance, an attenuation with partial fragmentation of its neurofibrils and an atrophy with distortion of its protoplasmic prolongations, the process terminating in either extreme pyknotic atrophy in which the shrunken cell and its prolongations are seen covered with incrustations; or in a fragmentation of the nerve cell to the extent that it is either a shadowy outline or an atrophic nucleus surrounded simply by a fragmented rim of pale granular protoplasm."

An excellent summary of the histopathological situation up to 1913 is that of Alzheimer (30) at which time he completed his life work on this subject, and presented the results of investigation on fifty-five cases, eighteen of which were not complicated by other diseases. He concluded with the impression that the "severe degree of sclerosis of ganglion cells with fatty degeneration signifies a severe injury to function" which would thus tend to explain the dementia precox mental reaction. Southard's (31) résumé of the literature up to 1919 and his own impressions on the subject are always of interest in this connection.

Of the more recent brain researches which have opened up new questions or have illuminated some of the older ones, we may mention the efforts at gross differentiations of precox brains by the Japanese workers Kure and Shimoda which might lead to the discovery of

racial variations or differences (32), the critical emphasis laid by Dunlap (33) of Ward's Island on certain cellular changes, the incidence of the acidophile degeneration in the nerve cells of "precox" individuals as recently described by Kelly (34) and the most interesting nerve cell findings described by Fünfgeld (35) as characteristic of the thalamus in dementia precox (catatonia). It is obvious that much of this work must be repeated utilizing large numbers of cases, showing a wider variety of clinical manifestations in order for it to become entirely conclusive.

There are numerous investigators who are loath to believe that dementia precox is primarily a brain disease or that there is any conclusive evidence of neuropathology characteristic of the disorder, nor to their minds is there any indication for suspecting a cerebral pathology. Hayes (36) has recently brought much evidence and theory to bear on the attitude that the dementia precox groups are deficiency diseases of the endocrine glands and that the described brain changes are secondary to those of the endocrine organs. He remarks that the childish reactions characteristic of some forms may well be due to the underdevelopment of the interstitial gonadal cells, and that the changes in the thyroid and adrenals may be held responsible for the characteristic emotional apathy and the circulatory weakness respectively.

Mott and his assistants have faithfully investigated the pathologic conditions of the endocrine glands of dementia precox patients, more particularly have they studied the testes, ovaries and the adrenals. In 1921 Mott (37) considered dementia precox to be a vital defect of the reproductive organs and of the brain in particular, and probably of the entire body. He offers what he considers to be sufficient pathological evidence to show that the disease is the result of an inborn germinal deficiency of productive energy of the reproductive organ associated with a progressive deterioration of psychophysical energy, the morbid manifestations of which show themselves in the whole organism. In 1922 Mott (38) stated his position in this manner. "By primary dementia is meant a progressive suppression of function of the highest phylogenetic and ontogenetic level of the central nervous system. This suppression is an irrecoverable condition; it may be preceded or accompanied by suspension of function which is a recoverable condition. The symptoms due to suspension do not necessarily differ from those of suppression of function, but whereas the former are due to a functional disorder or inactivity of the neurons of the highest level, the latter is associated with and dependent upon an organic defect of the nucleus." Genetic inadequacy

and neo cortex disturbance and perfect relations are here active in combination.

Mott has several times detailed the changes in the reproductive organs (39) (40). Matsumoto (41) also has described the various stages of regressive atrophy in the testicles of precox patients, however, most of the previous work on these organs was summed up by Mott and Such (42). In general there are two large groups of changes in the testes, those affecting the tubules, and those found in the interstitial cells. The alterations of the tubules are characterized by three stages of degree of regressive atrophy. *First stage*: "The changes indicate the formation of normal and degenerate spermatozoa and commencing failure in the formation of normal interstitial cells and by special staining and increase of interstitial fibroblasts." *Second stage*: "In addition there is an obvious shrinkage of many of the tubules, increase of fibroblasts, thickening of basement membranes and failure of spermatogenesis. The mature interstitial cells are fewer in number and there are numbers of immature cells with pale nuclei deficient in chromatin." *Third stage*: "The tubules show either no spermatogenesis or only a few tubules relatively show some spermatozoa—some being degenerate. There is a failure of formative nuclear activity and many or in advanced cases all the tubules consist only of a very thickened basement membrane lined by Sertoli cells. These cells usually contain lipoid granules in the syncytium and when this occurs there is lipoid in the interstitial tissues and cells. This indicates that the essential feature of the atrophy is a primary germinal defect."

"In seven cases of dementia precox a pigmentary deposit was found in the interstitial cells which is not seen in normal conditions except in old age and therefore may be recorded as evidence of pre-senile changes." Mott (43) also feels that his researches on the suprarenal glands has demonstrated that the medulla of these glands shows in dementia precox a vast deficiency in the genetic formative impulse. In fact he and Hutton (44) found that (a) these organs were smaller than normal with a typical thin, shrunken appearance, (b) that the medulla was narrowed and fibrous, and in some cases fibrous hyperplasia with abnormal cells and a few normal ones, (c) that the medullary cells were smaller than normal, vacuolated, with the nuclei small, pale and poor in chromatin. The nuclei varying much, and out of proportion to the size of the cell, and (d) that there was no change in the cortex except a widening of the fibrous septa. They summarize as follows: "The most constant change which is found in the medulla adrenalis in dementia precox is then,

the increased number of nuclei, irregularity of their size and form, and deficiency of chromatin. There is moreover an increase of fibrous tissue which often takes a pericellular arrangement and an increase of fibroblastic nuclei. In tuberculosis there may be a great diminution of cytoplasm, but these nuclear changes are not seen. In general paresis the nuclear changes are not observed and the cytoplasm as a rule is not affected to any extent."

However, Morse (45) tends to interpret the glandular changes found in precox, in terms of secondary or associated somatic disease influence. In her group of twenty-seven cases the condition of the sex glands in the controls were essentially the same as in dementia precox cases, for the same terminal diseases with exceptions of the feeble-minded, the infantile and emaciated cases. The pituitary and adrenal fibrosis found in half of the cases was not peculiar to dementia precox, but depended upon the nature and duration of a terminal disease. The thyroids showed changes less frequently than the other endocrines, but occasionally a mild glandular hyperplasia or an increase in connective tissue was observed.

The influence of tuberculosis in producing a fibrous increase in the ductless glands, particularly the pituitary and gonads has been emphasized once more by the study of this series, and the author concludes that there is very little evidence of a primary atrophy of the gonads in dementia precox with the possible exception of those cases developing on a basis of mental defect or hypoplastic constitution.

The above quoted research in many respects fails to satisfy; since in glancing through the clinical summaries of cases, one may note the evidence of a grouping of all sorts of reactions into a precox classification. There has been no differentiation between the frankly regressive types and those of a marked compensatory nature. Some of these cases were not dementia precox as I understand the disorder, but they represented paranoid reactions and even acute hallucinatory disorders based on a toxic state.

From the morphologic side of the question there is plenty of evidence of gonadal disturbance in the modifications and particularly in the attenuations of the secondary sex characteristics of both male and female subjects, although it has been quite conclusively demonstrated that other glands besides the gonads play an important rôle in the development of secondary sexual characters. However, Lipschütz (46) has demonstrated that normal development of somatic sex characters results if gonadal tissue is present in amounts even less than one-sixteenth of the normal quantity. These experiments con-

ducted on guinea pigs showed that although the process of development may be retarded after castration yet a complete evolution ultimately occurs, and it must be kept in mind also that he was dealing with normal healthy testicular tissue at the start, which condition may differ considerably from the true state of this tissue developing in the dementia precox syndrome.

From the standpoint of behavior Gibbs (47) in an interesting sex study, found that only 20.5 per cent of a large number of dementia precox patients had reached an adult level of sex behavior and maintained it even for a short time either married or single.

In 1923 I published a study (48) on the constitutional factors in dementia precox based on the findings in about 5,000 autopsies on the mentally disordered, from which I was forced to conclude that in true precox the circulatory system has not only been arrested in development, but lacks the ability to react by a satisfactory compensatory hypertrophy when occasion demands, and often remains below the average size after developing valvular insufficiencies. Ordinarily in the normal subject the heart under usual conditions gets larger as age advances, but this does not occur to any extent with the constitutionally small heart—it is small throughout life. The following observations will serve to further emphasize this factor, which certainly is a significant one when considered in terms of total integration, and compared and interpreted together with the evidence of possible compensatory trends on the part of other tissues.

Observation I. An Irish male, age fifty-four at death, single, occupation soldier, resided in hospital for 23 years, during the latter few of which he was classified as a paranoid precox. Accurate family history was not available and his early personal existence was not particularly interesting. He attended school for a short time and got along well, but left early to go to work and later enlisted in the army where he remained for eight years. About four weeks before admission to the hospital at the age of thirty-one he developed delusions of persecution and became violent and dangerous. A physical examination at this time revealed nothing remarkable.

The early notes on the case stated that the patient assisted with the ward work but was greatly confused about his past life, had no idea as to the length of his stay in the institution and showed no insight into his condition. He continued in practically the same condition which was occasionally broken by short periods of excessive irritability and excitement until February, 1922, when he was received on the sick ward complaining of pain in the feet and inability to walk. A physical examination at this time revealed the presence of a moderate arteriosclerosis and cardiorenal disease, for which he was placed on special treatment. He improved satisfactorily for a time, but in the following October he de-

veloped vomiting spells, violent headaches and pains in the chest, and died thirteen days later.

A post-mortem was performed revealing a brain weighing 1,400 grams. The surfaces of this large sized brain were free from exudate; however, the surface veins were congested and of a very complex arrangement. The sulci or gyri were also very numerous and of an unusually complicated pattern. The frontal poles showed a thickening of the pia with adhesions and underlying cortical atrophy. The base of the brain was somewhat softened and there were blood diffusions in the anterior perforated spaces and about the optic commissure. The basilar arteries were very small, being distinctly hypoplastic.

This brain was not sectioned but was preserved for anatomical purposes and later studied by students. Other interesting post-mortem findings were bronchopneumonia with congestion and edema of the lungs, diffuse productive nephritis, adenoma of the prostate gland and a moderate degree of disseminated arteriosclerosis which however was not visibly present in the brain vessels.

Special examination of the endocrine glands was not carried out in this case, but it was noted that the adrenals showed a central adenomatous hyperplasia. Of special interest was the heart and great vessels which organ was small and out of keeping with the size of the other viscera, weighing only 250 grams and with valves free from lesions. The myocardium was pale, softened and exhibited a very small amount of fibrous replacement. The endocardium showed scattered but slight opacities. All great vessels were correspondingly small. The general trend of this patient's psychosis was a regressive one and his constitution was undoubtedly of that type as evidenced by the hypoplastic circulatory system. However, it is of interest to note that he had some projection mental features in the form of persecutory ideas and irritability, having been considered a dangerous man, so in some of the structures there are changes which I prefer to interpret as compensatory tissue responses. I here refer to the hyperplasias noted in the prostate and of more importance in the adrenals. The hypoplastic circulatory system also shows this moderate stress in the form of arteriosclerosis, and to my mind there is a definite connection between these mental and tissue findings. With the circulatory handicap it was impossible for this man to complete his hyper-compensations although such attempts were recorded in the tissue alterations.

In connection with the finding of arteriosclerosis in dementia precox. I find it rarely in true precox states but Lie (49) of Norway in an investigation has examined seventy men and forty-two women with precox from this point of view during a three-years' period. Peripheral arteriosclerosis was evident in 54.4 per cent of men and in 10.5 per cent of the women. Syphilis could be incriminated in only two cases. However, he lays the stress upon tobacco since all of the men and some of the women had used tobacco excessively for a great number of years, several beginning the habit in extreme youth.

Without knowing more of the facts of the mental and general physical construction of his group of patients I wonder if his percentages do not represent those patients with mild "paranoid" projection or compensatory trends, which should be more closely and carefully differentiated within the "precox" group.

Again from the circulatory standpoint let us consider:

Observation II. An American, male, soldier, single, age sixty-three at death, a resident of the hospital for 42 years, having been admitted at the age of twenty-one years during the year 1881. Notes on his case were not filed until 1913 at which time he was said to be in a very demented condition, being disoriented in all fields, destructive of clothing, careless about personal appearance and very untidy with excretions. About once per month he had outbreaks during which he was very noisy, violent and destructive. The only notable physical findings were inequality of the pupils and a failure of both to react to light or accommodation although there were no laboratory or other physical signs suggestive of syphilis. This pupillary sign may be interpreted as belonging to a group of autonomic phenomena sometimes seen in precox cases.

During the subsequent years the patient showed very little change, continuing to be disoriented in all spheres, and standing about the halls doing no work and seldom taking a seat. Questions were apparently poorly understood and replies were quite unintelligent. Since he would not coöperate a thorough mental or physical examination was not possible. In January, 1923, he was admitted to the sick ward with a temperature of 102 degrees and was found to have a right sided pneumonia from which he died six days later. His case was diagnosed as hebephrenic dementia precox.

At the autopsy the brain weighed 1,090 grams and showed surface hyperemia. The basilar blood vessels were very thin, quite small and distorted from the usual courses; the cerebellar arteries and the anterior cerebrals were unusually small. There was a mild surface irritative meningitis, and the ependyma were somewhat granular in addition to the presence of small nodules resembling miliary tubercles along the walls of the vessels. Small tubercles were also seen on close inspection along the vessels of the sylvian fissures. On the anterior wall of the ependyma of the occipitotemporal junction of the left lateral ventricle there was a small round cyst 1 cm. in diameter containing a yellow caseous material; the ependyma and a thin layer of subependymal tissue formed the outer wall of this cyst which was tuberculous in character. After fixation this brain showed a general diffuse superficial surface softening and was slimy to the touch which is a seldom emphasized post fixation phenomenon frequently noted in the nervous tissues from those who succumb from tuberculosis regardless of its form or location.

The heart weighed only 250 grams, being quite out of keeping with the sizes of the other organs, and the epicardium was nearly destitute of fat, but showed the opacities of mild fibrous replacement, the coronaries being somewhat tortuous and prominent, probably from surface atrophy. The

ventricles were in extreme systole and the valves were apparently normal. The great vessels were hypoplastic, but were in an excellent state of preservation as far as senile changes or lesions were concerned. The aorta presented a few small atheromatous patches in the arch.

Other post-mortem findings were right lobar caseous pneumonia, which was the lethal lesion, parenchymatous degeneration of the liver and diffuse productive nephritis. Since this autopsy occurred before an active interest was taken in the endocrine organs, no minute examination was recorded, but the lesson that may be drawn from this case is that a hypoplastic circulatory apparatus remained in practically its infantile or youthful condition during a period of 42 years of extreme mental and physical deterioration, failing to enlarge or sclerose after the fashion of senile circulatory tubes, and finally late in life at the age of sixty-three dying with the complication of tuberculous meningitis which was a secondary development from an acute tuberculous caseous pneumonia. Such a circulatory constitution predisposes to tuberculosis—a theory which I proposed in 1923. The total reaction is here globally regressive.

Then again we have from the standpoint of the circulatory system only:

Observation III. An American, male, single, laborer, aged sixty-eight at death, who was in St. Elizabeths for 36 years. The family history was negative and the patient stated that he himself had never been sick in his life. He denied venereal infections but admitted a moderate indulgence in the use of alcoholic liquors. He entered school when six years old, continued until fifteen, learning normally and left to learn the trade of upholsterer, working nine months for \$2.50 per week. After leaving this job he worked at various odd jobs, the highest wages received being \$5.00 per week. At the age of twenty-five, he enlisted in the Navy and served for seven years, during which time the only episode of note remembered was being knocked unconscious by a blow on the head from a club while singing a song in the street. He was never able to give a reason for his being sent to this hospital, but either assigned absurd causes or dismissed the question with the statement that the institution was not a hospital but an old people's home or a prison. At that time he thought people were putting poison in his food, which poison worked through his system and was wearing his brain out.

A physical examination recorded in 1913 when the patient was about fifty-seven years old stated that he was a sparely built, poorly nourished old man with ruddy complexion, whose muscles were emaciated and of poor tone. The extended hands and tongue showed a fine tremor, the knee jerks were normal, the teeth were in excellent condition for an old man, pulse 82 per minute and the pupils were normal in size and outline, responding promptly to the usual tests. He also had a soft, freely movable, cystic tumor about the size of a hen's egg, located in the occipital region beneath the scalp.

At this time he showed considerable deterioration, was somewhat oriented as to time, but not as to place or person, and his principal delusion was being choked nearly to death by constant charges of electricity. His memory was badly impaired and at times his answers to questions

were so confused as to be quite unintelligible, although with all of this dilapidation he remained fairly neat in personal appearance and habits.

He occasionally did a little ward work under close supervision until September, 1922, when it was noted that he was getting very feeble and stiff in his movements, and at this time was totally unable to carry on a conversation but mumbled to himself in an incoherent lingo. He continued in this condition until October, 1922, when he was transferred to a sick ward with a distended abdomen and edematous lower extremities among other symptoms of myocardial failure. His temperature remained subnormal, and he failed to respond to treatment, but died in December, 1922. He was obviously an old deteriorated precox of the hebephrenic type.

At the autopsy the brain was found to be quite small weighing only 1,015 grams, pale in color and showing generalized atrophy, the convolutions being very narrow, angular and firm. There were no gross lesions, but the blood vessels throughout were very small, thin and fragile. This description applies to all of the arteries and arterioles. The pia was very thin, showing no evidence of disease. The cranial nerves particularly the optic pair were comparatively large in size.

The heart weighing 410 grams was larger than the average precox heart and was much larger than originally since the great vessels were all hypoplastic. The pericardium was smooth and bathed in 10 c.c. of amber fluid. The epicardial fat was slightly increased and the myocardium moderately hypertrophied plus connective tissue increases, although the mitral tricuspid and pulmonary valves were not remarkable. The aortic valve cusps and the entire aorta evinced the scattered minute yellow plaques of atheromatous changes, which were accentuated at the bifurcation.

Other anatomopathologic findings were lobar pneumonia, typical atrophic cirrhosis of liver with peritoneal effusion, chronic passive congestion of spleen, chronic cholecystitis and a mild patchy peripheral arteriosclerosis.

The compensatory possibilities of this patient were obviously totally inadequate to prevent an early and permanent deterioration, although he lived for many years at an extremely low level of adjustment. The adjustment through hypertrophy of an originally small heart was the only compensatory attempt revealed on the part of the tissues.

In order to emphasize that the small circulatory system is not due to a prolonged period of somatic inactivity we may note Observation IV. A Jugo-Slav, male, soldier, single, age thirty-three at death, a resident of the hospital for one year, having been admitted at the age of thirty-two. The family history was unknown. The patient had a few of the usual diseases of childhood, had attended school for only six months, but was able to read and write in his native language but not in English. He worked on a farm until 1909 when he came to this country at the age of twenty, after which he spent most of his time in the New England States working in woolen and cotton mills, upon roads and in restaurants, earning from twelve to fifteen dollars per week. He admitted a moderate use of alcohol and denied all autoerotic, homoerotic and heteroerotic experiences.

He enlisted in the American Army in August, 1919, where he was said to be efficient in his duties but did not get along very well socially with the men in his company. He was first sent to Fort Slocum, then to San Francisco, then to Honolulu, and to Vladivostock, and finally to the



FIGURE I. Photograph of "dementia precox" brain showing thin, hypoplastic basilar vessels.

Philippines where he had a year of tropical service. Here he became mentally upset and was sent to the Sternberg Hospital for mental observation. He explained the necessity of this procedure by stating that three days before admission to the hospital while he was a room orderly in the barracks some soldier struck him on the head in the dark. He was afraid they might harm him further so he ran away—discarded his clothes—

swam the bay and remained in hiding until he was nearly starved. After two days he obtained some food and clothes from the natives and voluntarily returned to the post from whence he was taken to the hospital. He was sent to the States and admitted to the Letterman General Hospital where the records show that he refused to eat for three or four days because of a delusion that the food had been tampered with. He was retarded, had ideas of reference and persecution, was seclusive and unsocial, and remained in one position gazing aimlessly at the sky for long periods of time. He was admitted to the Walter Reed Hospital in September, 1921, at which time his attitude was one of suspicion and mild confusion. He took no interest in ward activities, refused to do occupational therapy, failed in most of the intelligence tests and showed marked emotional "deterioration" (deviation).

At the time of admission to St. Elizabeths Hospital he was well nourished, general physical examination negative, and at this time a mental examination was impossible—all questions being answered by "I don't know." However, he was encouraged to do a few light tasks.

No change was noted in his condition until December 5, 1922, when it became obvious that he was losing weight, coughed some and complained of a sore throat. He was admitted to the sick ward where a physical examination revealed an active pulmonary tuberculosis involving the upper lobes of both lungs. He rapidly grew worse, developed a tuberculous pneumonia and died December 31, 1922.

The autopsy revealed a brain weighing 1,450 grams, of the Teutonic shape with wide transverse diameters and with convolutions numerous and complexly arranged. The cerebellum was large, in keeping with the rest of the brain. The pia throughout showed some secondary meningitis of the irritative type. All vessels of this large brain were particularly small, being typically hypoplastic.

The heart weighed 260 grams, being very pale and showing moderate acutely degenerative changes. The epicardial fat was diminished in amount. All the great vessels were hypoplastic, thin and very elastic.

Other necropsy findings were bilateral chronic ulcerative pulmonary tuberculosis with tuberculous pneumonia, right tuberculous pleurisy, tuberculous mediastinal lymph nodes, tuberculous peritonitis, tuberculous ulcers of ileum and fatty degeneration of liver and kidneys.

This case was diagnosed as dementia precox, hebephrenic type; although the age at onset was considerably later than the average reaction of this variety. In this connection it is of interest to note that in spite of his hypoplastic circulatory handicap he was able with some reservations to make a satisfactory or at least an acceptable adjustment to reality until past thirty years of age. However, when the break came it advanced rapidly and terminated quickly with the lesions most commonly found in this type of mental reaction. The relations of true dementia precox, tuberculosis and the hypoplastic circulatory constitution will be further discussed as we proceed.

Another instance of circulatory hypoplasia in late precox (catatonic variety) development with rapid termination in six months may be outlined in:

Observation V, a colored female domestic, married, age thirty-eight years at death, was admitted to the hospital in the same year. Her parents lived to an advanced age, and her early life was said to be uneventful. She attended school through the fourth grade, was healthy and made a good social adjustment. She married at the age of twenty-eight and had two children both of whom are living and said to be normal. Three months

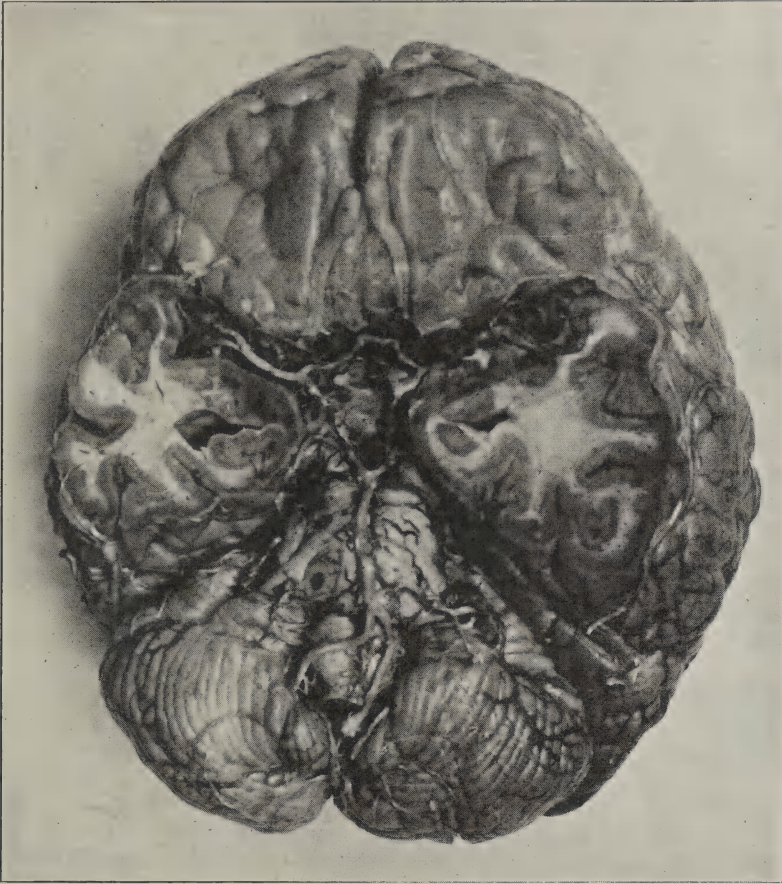


FIGURE II. Photograph of "dementia precox" brain showing hypoplasia of basilar vessels and an additional moderate patchy arteriosclerosis.

before admission, her mental disorder was initiated by what was termed a convulsion following which she seemed confused, could not remember anything and wandered aimlessly about the ward. She was totally disoriented in all spheres, stuporous and catatonic, talking in a low tone of voice. Hallucinations were suspected but not definitely determined.

The physical examination at the time of admission revealed advanced pulmonary tuberculosis, dry scaling skin, a chronic leg ulcer, edema of lower extremities, heart rate of 86, sluggish pupillary reactions, positive Romberg, and hyperactive reflexes.

She was transferred to the special wards for tuberculous patients, where she led a vegetative existence both physically and mentally until death occurred six months later. The lethal lesions discovered at autopsy were: advanced acute pulmonary tuberculosis with cavitation of the left lung, tuberculous pleuritis, miliary tuberculosis of liver, and tuberculous peritonitis.

The brain weighed 900 grams showing marked atrophy over the frontal areas but no lesions, either gross or microscopic, characteristic of a particular brain disease were found; however, the cerebral vessels were strikingly hypoplastic. The entire circulatory system was hypoplastic, the heart muscle was soft weighing only 200 grams, but the valves were normal.

Such examples as the above two observations would indicate that the circulatory hypoplasia in true precox is not due to a prolonged ward confinement or period of inactivity, but is an original defect. The last case also demonstrates the possibility of certain neurogic symptoms being present in precox reactions. This is emphasized in the study of 400 precox cases by Steck (50) in his attempt to associate this disease with some of the symptoms found in post-encephalitic states.

Again we offer an interesting study in Observation VI wherein the major endocrine glands were also included. An African, female, domestic, widow, aged forty-five years at death, was a resident of the hospital for three years. Nothing of significance was obtained from the family history excepting that her mother died at sixty from a "stroke" of paralysis. Birth and development of the patient was normal and she had the usual childhood diseases. Menstruation began at twelve. School was entered at nine, the fifth grade reached at fifteen at which time she stopped to go to work. She married at seventeen, and had one child. Her husband soon neglected her and finally left, after which she went to live with her mother—where she worked out to support them both.

About three weeks before admission to the hospital she became involved in altercations with her mistress over some petty affairs, and refused to be discharged even after her belongings had been deposited on the porch. This refusal to be discharged accompanied by some peculiar behavior made it necessary to call an officer who, failing to convince her of error, took her to the Washington Asylum Hospital. Here she claimed that people tried to blackmail her and that two persons tried to make her a permanent member of the family for whom she had worked (projection trend). Another complaint was that passersby, both colored and white, particularly children, called her bad names.

On admission to St. Elizabeths she was quite tractable and agreeable but refused a physical examination and had no insight into her hallucinations and delusions. She persistently denied that anything was the matter with her mind and adhered firmly to her belief that she had been called names and otherwise badly treated. Her fund of general knowledge was good, and she had formerly spent much time reading the Bible and books on history. She was oriented, somewhat depressed, but at times quite

inaccessible and not frank in her statements. Memory for recent and remote events was good for accuracy, details and time elements, calculations were also good. She was considered to be a case of "paranoid dementia precox."

During the three years' residence in the hospital there was a slow but evident deterioration with episodes of violence and confusion and periods of resistance and tube feeding. She was usually neat, but could not be encouraged to help on the wards or to do other than care for herself. She spent most of her time in seclusive spots talking to herself out of the windows. The patient finally became bedridden, showing progressive physical and mental failure. Pulmonary tuberculosis was suspected but the patient was so sullen, resistive, irritable, threatening and combative that no satisfactory examination was possible. There was no cough, but there was great emaciation and the pulse was feeble and irregular. One day she died suddenly and was brought to autopsy.

The body was poorly nourished with a dry, scaly skin and pale muscles. The brain weighed 1,010 grams showing a moderate general shrinkage with adhesions to the skull which showed distinct osteosclerosis. The lungs were in advanced stages of the chronic ulcerative form of tuberculosis. The heart weighed only 210 grams, being soft and flabby but free from valvular disease, and the aorta and its branches were notably hypoplastic. The uterus exhibited numerous intramural fibroids with a large one in the fundus of the organ.

The gross appearance of the pituitary was not remarkable but microscopically the posterior lobe was traversed by a large dense band of fibrous tissue and in addition showed a general increase in connective tissue stroma with all vessels considerably thickened. The pars intermedia was small in amount and the cells of the anterior lobe were very small, containing small sized poorly stained nuclei with, however, a considerable predominance of acidophilic cells. The stroma of the anterior lobe was only slightly increased, but there were a few colloid droplets noted.

The thyroid was pale and small in size. Microscopically the colloid was reduced to about one-third the average amount, and the acinal lining cells were small, angular, heavily stained and exhibited a complete loss of nuclear vesiculation, but there was an occasional group of colloid vesicles resembling the normal state. The interacinal epithelial cells were increased in patches, and the interstitial connective tissue including the outer capsule was increased throughout. The elastic tissues were markedly increased in wide bands through the stroma and about the vessels, but the internal elastic membranes were normal. The blood vessels were deeply congested, many capillaries had ruptured causing universal distribution of free red blood cells and deposit of blood pigments.

The pancreatic tissue had undergone post-mortem autolysis, but the connective tissue substance appeared normal. Microscopically the lobules were contracted showing the acini small and darkly stained. The islands gave an acid staining reaction, and there was an increase in the fibroblastic stroma about the vessels, ducts and through some of the lobules. There was an increase in collagen in the vessel walls and occasionally a large strand was seen in the stroma of the gland. In the larger vessels there

was a reduplication of the internal elastic membranes, but through the tissue in general the elastic tissue was not notable.

The adrenals were small, thin, and light yellow in color with a normal grey appearing medullary substance.

Microscopically the ganglion cells of the medulla showed fragmentation of the chromatin and degenerative pigmentation. In patches the medulla was hyperplastic, but on the whole appeared fairly normal. The cortex while somewhat hypoplastic was fairly well preserved in all zones, but in patches there was some hyperplasia of cells, with groups of large acini closely approximated. Some individual cells were hypertrophied. The glands as a whole showed no increases in connective tissues.

The ovaries were small in size and firm, but still showed some surface follicles. The germinal zone was about half replaced by fibrohyaline tissue, but in spite of marked fibrosis a few graffian follicles were noted, which follicles were rather rudimentary and sclerotic. The blood vessels were thickened presenting a moderate amount of hyaline degeneration in the walls, much collagen production and some obliterating endarteritis with an increase and reduplication of the internal elastic membranes throughout the glands.

Probably because of its late onset and the prominence of a few persecutory trends this case was diagnosed as "paranoid dementia precox"; however, the deterioration and termination were rapid and accompanied by classical catatonic-hebephrenic mental symptoms, after the constitutional compensatory possibilities were once broken. The break did not occur until relatively late in life, and although there were numerous personal and family troubles the patient adjusted to these circumstances until the period of middle age.

The pathologic picture is in keeping with the catatonic-hebephrenic constitution, and although the circulatory system was hypoplastic the basic endocrine make-up showed fair organization and preservation in spite of an actively destructive lethal tuberculosis. Perhaps this is the explanation of the compensatory features including the delay in the manifestation of the psychosis. The thyroid with its reduction in colloid and interstitial changes showed the greatest damage while the adrenals were in fair condition as were also the ovaries, considering the period of life.

A word might be said here regarding the status of the heart in tuberculosis. "In the Vienna Medical Society, Dr. Herz, lecturer on diseases of the heart in the University of Vienna, said that since the announcement of Rokitansky in 1846 of the theory of the supposed antagonism between valvular heart disease and pulmonary tuberculosis, many observers have sought to bring forward clinical evidence in its favor. It is generally believed, that valvular disease affecting the left side of the heart has a more or less retarding influence upon the progress of chronic phthisis, or even that individuals so affected are to some extent exempt from the attacks of the tubercle bacillus. The explanation which has been offered for this antagonism

is that a sort of immunity is conferred through the venous stagnation and consequent chronic congestion which is maintained throughout the pulmonary circulation.

"That this so-called immunity is by no means absolute, nor indeed constant is proved by the fact that the concomitance of the two affections not infrequently occurs. Dr. Herz has found that smallness of the size of the heart, which at one time was thought to be an important predisposing cause of tuberculosis, is generally discovered at the post-mortem, as ably described by Dr. G. S. Norris of Philadelphia, but Dr. Herz considers that this may be equally the result of the generally impoverished condition of all the body tissues. On the other hand patients suffering from pulmonary stenosis are exceedingly prone to contract phthisis, and this is not surprising when it is borne in mind that this particular cardiac lesion is frequently associated with congenital abnormalities which do not improve the general poorly aerated condition of the blood. Actual tuberculosis of the heart itself is exceedingly rare but it has been estimated that some degree of tuberculous endocarditis is met with in something under five per cent of all cases of phthisis submitted to autopsy. Degeneration of the cardiac muscle commonly occurs in pulmonary tuberculosis, which probably accounts for the failure of digitalis in many cases."

I feel that I have previously conclusively demonstrated that the small heart and vessels found in true dementia precox are not due to atrophy or general malnutrition, as Dr. Herz has suggested to account for the small heart in tuberculosis; in fact a pathologist of limited experience should have no difficulty in distinguishing atrophy from hypoplasia in this particular connection. I also feel that the hypoplastic circulation with its associated enlarged and stagnant constitutional lymphatic organization predisposes to tuberculosis and therefore accounts for the universally reported large percentage of deaths from this disease in the catatonic-hebephrenic group.

Some of these cases are of long duration, are senile when brought to autopsy and present many interesting though obviously very complicated problems. Such a case is:

Observation VII, an American male, soldier, single, aged sixty years at death, a resident of the hospital for 34 years. The family and personal histories were never obtainable from the patient, therefore we must rely upon his behavior for our clinical facts. He was admitted to the hospital in 1887 but there were no recorded notes until 1905 at which time he was said to exhibit many peculiar mannerisms chief among these being a peculiar noise made for the purpose of punctuating his sentences. He was very rambling, noncoherent and thoroughly unintelligent in conversa-

tion; appeared demented, careless, indifferent, talked to himself, was untidy in dress, gave evidence of auditory hallucinations and was frequently resistive and negativistic. He usually had a disagreeable facial expression, often insulting in speech, but at times was very silly in behavior. Generally he was sullen and quiet, but occasionally became aggressive, profane and obscene, cursing at his auditory hallucinations. He changed very little during the years except to add new grimaces and other peculiar mannerisms to his list.

In 1912 a physical examination was attempted, but the situation was met with such enormous resistance on the part of the patient that it required three attendants to obtain his height and weight which were 5 11/12 feet and 165 pounds, respectively. The patient remained in the before described mental state until 1921 when he suddenly developed a high temperature with rapid pulse and respiration and soon died from lobar pneumonia.

At autopsy the body showed some emaciation. The brain weighed 1,350 grams, the hemispheres being large, wide and well developed. There was some morbid adhesion of the pia to the dura, and a moderate senile atrophy of the frontal and parietal convolutions. Otherwise the organ appeared normal. Microscopically there was a marked dilatation of the perivascular spaces with the contained vessels being very small and thin-walled. The neuron cells showed no change excepting an early inflammatory reaction. Neuroglia were universally moderately increased.

The heart weighed 300 grams and gave the impression that it was flabby and acutely enlarged. The muscles were pale yellow throughout from fatty degeneration, there being very little if any visible fibrous tissue response. The mitral valve cusps showed small nodular enlargements along the margins, the tricuspid orifice was dilated, but the aortic area including the valve cusps and arch was moderately sclerotic, but no ulcerations were noted and the aorta as a whole was hypoplastic and had retained its elasticity to a great extent.

Other post-mortem findings of interest were bilateral lobar pneumonia with gray hepatization (bacteriological smears showing pneumococci, streptococci, and a large streptobacillus), extreme fatty degeneration of the liver, diffuse productive nephritis and anomalies of the thyroid.

The gross appearance of the pituitary was normal in all respects, the dural covering being normal in thickness, the sella deep and the clinoid processes widely separated allowing for uninhibited possibilities in expansion of the gland. Microscopically the anterior lobe cell groups were very small in size but numerous and in patches showing predominance of basophilic cells which were angular in contour, actively proliferating, exhibiting mitotic figures, and tending to columnar cell types of various sizes. The posterior lobe was heavily fibrous and excessively pigmented while the pars intermedia appeared normal. The fibrous capsule of the gland was normal with the exception of marked congestion of capillaries.

The thyroid was anatomically peculiar, there being besides the two usual lateral lobes an isthmus consisting of two smaller lobes and also in addition a small round pediculated lobe which was attached to the lower pole of the left lateral lobe. This combination made the thyroid excessive

in size, but gross sections showed the lateral lobes to be average as far as the colloid was concerned, although the pediculated lobe was heavily sclerotic. Microscopically the stroma of the gland was diffusely increased showing the formation of many fibroblasts, particularly in the acinal walls between the layers of epithelial cells. The chief and other epithelial cells reacted normally to the stains and the colloid was evenly distributed in rather normal sized accumulations. The vessels were all thickened and about many were small heaps of thyroid epithelial overgrowth.

The pancreas was very large in size, deeply imbedded in fat, pale in color, and exhibited both post mortem changes and fatty replacements.

Microscopically the substance was considerably lobulated by increased connective tissue overgrowth with many of the lobules disintegrated from autolysis. The elastic tissue productions and collagen were universally abundant. The islands in general were normal in appearance, but some presented sclerotic changes with dropping out of parenchymatous cells. In some areas there was a very dense sclerosis of pancreatic substance with hypertrophy and hyperplasia, alternating with atrophy of both acini and islands.

The adrenals showed extreme exhaustion in the medullary structures, and the cortex was very pale in color in addition to being irregularly atrophied. Microscopically, three cortical inclusions were seen in the fibrous capsule, although this capsule was not thickened and there was no overproduction of connective tissue considering the age of the subject. The cortex was narrowed throughout, the outer zone being represented only by a few hyperplastic glands. The cells of the entire cortex were fairly well stained, and the outer layer exhibited many mitotic figures in the above mentioned hyperplastic areas. The central and inner layers of the cortex were very narrow and contained relatively few cells, but these were normal in construction.

In patches the medulla was hyperplastic and presented a marked round cell infiltration, but in other areas there was a dense fibrosis with extreme narrowing of the tissue. The blood vessels were moderately thickened, but with no acute changes, and the elastic tissue fibers were in overabundance throughout the entire gland and particularly in the outer fibrous capsule.

The testicles were notably atrophied, and microscopically they were damaged to a greater extent than is found in the average senile. No spermatozoa were seen and the tubules were thickened in patches to complete obliteration by fibrous tissue inroads. The interstitial cells were situated in small groups composed of atrophied and highly pigmented cells.

The deteriorating process in this individual covered an unusually great number of years and there were many features about the psychosis which early suggested one of the slower developing progressive paranoid types of development. However, a careful study of the longitudinal aspect of his case with its scattered content and multiplicity of symptoms convinces one that we are here dealing with hebephrenic dementia precox. He was usually in touch with his environment and projected to the extent that he was very difficult to care for, and never offered the least coöperation while in this hospital. He apparently escaped tuberculosis entirely,

although he might be considered to have been predisposed. His circulatory system was hypoplastic, and the heart must have been originally quite small for a man of his size, as even with the certain amount of compensatory hypertrophy it weighed only 300 grams. Its capacity to hypertrophy was apparently not very great.

The adrenals and the testes showed several features of the dementia precox constitution while the thyroid showed excellent preservation with great compensatory possibilities, but senility with its predisposition to pneumonia finally destroyed or attenuated the converted adjustments of the organism to the extent that viable equilibrium was no longer possible on the basis of such fundamental constitutional defects.

Observation VIII dealing with another deteriorated patient may prove to be of interest. An American, male, soldier, single, aged fifty-eight years at death was admitted to the hospital at the age of twenty-one. Although he came in 1883 no available notes were made on his case until 1905 at which time he was extremely nervous and restless, continually picking at his clothing or collecting small bits of trash from the floor. His memory was poor and he was almost totally disoriented, but knew a few of his attendants. His physical health was considered to be good, but his sleep was restless. In 1907 he was said to be quiet and orderly, but inclined to be careless, and moved around in an aimless manner at times. Mentally he was dull, was unable to gain any additional information, and seemed perfectly satisfied with his surroundings. No particular change was noted in his condition until 1917 when he showed some emaciation, and became more deteriorated, delusional, untidy and destructive. In 1920 he developed erysipelas from which he never recovered.

The brain weighed 1,110 grams, showing a moderate amount of general shrinkage. The pia was adherent to the cortex and its vessels were somewhat atheromatous. The dura over the base exhibited an early new formation membrane with a considerable amount of rusting, and the cerebrospinal fluid was in great excess. The arteries of the base were not particularly sclerotic with the exception of the carotids which were distorted and showed some calcium infiltration.

The heart was in normal position and weighed only 250 grams. The surface of the heart showed many opacities and sclerotic coronary branches; the muscle showed considerable fibrous replacement, the mitral valve was contracted and sclerotic, the aortic valve area was sclerotic and presented one large sized vegetation, immediately above and partially occluding the left coronary orifice, the tricuspid was dilated, and there was a small organizing thrombus in the right auricular appendage.

The aorta was small and exhibited a diffuse endothelial blush and was affected by chronic ulcerative aortitis along the arch and in the iliac region, where small attached thrombi were occasionally encountered. Much calcification was present in all of the iliac branches on both sides of the body, and the left internal iliac was completely occluded by an organized thrombus.

Other post-mortem findings were general streptococcic septicemia (erysipelas), pulmonary infarction with gangrene, infarction of mesenteric vessel with gangrene of strip of intestine, and chronic passive congestion of the liver and biliary stasis.

The pituitary was extremely small and flattened and was surrounded by heavily sclerosed vessels. Microscopically the anterior lobe cells were heavily stained and in patches were not well differentiated, but there was a marked predominance of acidophilic cells, a cyst filled with amorphous material, probably arteriosclerotic in nature and located in the center of the anterior lobe, and a miliary columnar celled basophilic adenoma near the capsule. The posterior lobe was sclerotic and excessively pigmented. There was a marked congestion throughout, as would be expected.

The thyroid was very small, quite pale, and firm, but still contained a considerable amount of colloid. Microscopically the blood vessels were thickened, atheromatous, calcium infiltrated, and acutely engorged with blood. There appeared to be very little reduction in colloid, which was contained in very large and very small acini, but there was some increase in epithelial cells and stroma. The chief cells were unusually linear, but in some places were normal. Very few epithelial nuclei retained the normal vesiculated appearance. Appropriate stains showed marked microchemical differences in various portions of the gland.

The pancreas appeared normal and well preserved considering the age of the subject. Microscopically it was heavily stained and not very well differentiated. The stroma was less in amount than the usual senile exhibits, but there were many large accumulations of fat seen through the lobules. The islands were small in size but were composed of a large number of small epithelial elements, but occasionally a large normal island was seen. The arteriosclerotic changes were very mild, but there was considerable collagen about the vessels.

The adrenals as a mass were normal in size, but showed a moderate hypertrophy of the cortex which was irregularly colored a light yellow alternating with patches of deep orange. The medulla showed hemorrhagic streaks through both glands, and the vessels were quite atheromatous. Microscopically all that remained of the outer cortical zone was a few small patches of cell groups. The fibrous capsule was congested, thickened, and included small groups of cortical cells. The cells in all cortical zones showed hyperplastic tendencies, but there were regressive features as well, and in addition acute degenerative features with fatty dissolution were eminent.

The medulla was hyperplastic and included several islands of compact, heavily pigmented, darkly stained cell groups. Many of the medullary cells were acidophilic, and there was a notable round cell infiltration of this substance as well as some arteriosclerotic features.

The testicles were of average size but somewhat increased in consistence. Microscopically there was a marked increase in intertubular stroma but a decrease in the interstitial epitheloid cells of Leydig. In one large area the tubules had become dilated and irregular, with distinct adenomatous changes, the acini being lined with a low type of columnar epithelium; however, throughout the gland the walls of the tubules were thickened and these structures nearly depleted of spermatogenic cells. Very few spermatozoa were seen, averaging not more than ten to each tubule.

The clinical history of this patient fulfills all the requirements for a precox diagnosis; the break came early and was permanently established

at the age of twenty-one. Thirty-seven years followed, during which the patient gradually deteriorated. His circulatory system was very small but he escaped tuberculosis probably through compensatory tissue reactions. The thyroid and the pancreas were well preserved and to a limited degree the adrenals had apparently shared in the attempts to equilibrate the organism, although the interpretation is here quite difficult, since pre-senility and in addition an acute septicemia have contributed to and partly obscured the original pathologic picture, if such existed. One thing is obvious, that notwithstanding the presence of a degree of general arteriosclerosis unusual for the true precox constitution, the original hypoplastic circulation dominated the picture, and undoubtedly contributed to the sclerotic disintegration of the personality with its complicated systems of organs.

Finally another case extending to senility and in which compensatory features are found should be cited in order to bring out these factors as well as those of senile modification.

Observation IX, a Scotch male, single, soldier, who was admitted to St. Elizabeths Hospital at the age of nineteen, remaining here 52 years, and dying of pneumonia at the age of seventy-one. Although the patient was admitted in 1869, the first permanent notes were made in 1907 (38 years after admission) at which time dementia and inaccessibility of the patient made it impossible to obtain any family or personal history. However, he was quiet and orderly, had parole of the grounds and associated with other patients, but his memory and judgment were very poor and he was notably untidy in appearance.

A gait described as "feeble," a slightly hypertrophied heart, and fine tremors of the tongue and of extended fingers were the only positive physical findings mentioned. In 1914 he was said to be disoriented in all spheres and showed a marked speech defect which was interpreted to be a mannerism. It was very hard to understand his language which was partly neologistic. By this time senility was evident and his memory became entirely lost although he continued with ground parole and tried to do some work in the dining room.

In November, 1920, he was admitted to the sick wards with a right scrotal hydrocele for which operative procedures were necessary. A good recovery was made from the operation which was done in December. He was said to have had a chronic myocarditis which gave him intermittent decompensation symptoms, and about April, 1921, he began to show acute manifestations of heart failure with marked dyspnea. I emphasize this reaction since I believe it to be of rare occurrence in dementia precox, even in the aged deteriorated types.

He died in May, 1921, and was brought to autopsy. The congested brain which was rich in convolutions, weighed 1,190 grams and was so adherent to the calvarium that it was necessary to remove them together. While there were no localized gross abnormalities of the brain, the cortex in general was shrunken and markedly sclerotic. The cerebellum was large in proportion, but the spinal cord was small and sclerotic; however, on complete examination it was the impression that the degree of sclerosis

was not adequate to account for the general small size, but that we were dealing with a moderate myelodysplastic phenomenon not in the sense of a Friedrich's manifestation but perhaps one more in keeping with Adler's (51) conception of spinal cord inferiority.

The heart weighed 300 grams, the muscle fibers appearing hypertrophied and showing a moderate amount of interstitial replacement. The mitral valve was slightly stenosed and the margins of the cusps were thickened, the aortic valve cusps were slightly thickened, and the adjacent aorta showed a symmetrical thickening. The coronary vessels appeared normal considering the age. The aorta and its branches were small, but characterized by atheromatous plaques, thin calcium formations, small denudations, and impaired elasticity along all endothelial surfaces; however, the lower thoracic and abdominal portions of the aorta exhibited the most extensive changes. Here it will be noted that even in the face of arteriosclerosis and distinct cardiac hypertrophy the heart reached only 300 grams which weight is still well under the average heart, and that in general the circulatory system was not able to make adequate compensatory adjustments.

Additional post-mortem findings were acute hypoadrenia and bilateral confluent bronchopneumonia.

The pituitary fossa was roomy and normal in appearance, but the gland was very small, firm, and covered by a thick, white fibrous capsule. The posterior lobe was soft and disintegrating. Microscopically there was an acute cloudy swelling of all cells of the anterior lobe which reduced all types to the same level of interpretation with practically no nuclei to be seen excepting shadowy outlines, and the swollen protoplasm completely filling the centers of the cell groups. The gland as a whole showed an increase in the connective tissue stroma, and was brightly congested exhibiting numerous hemorrhages throughout both lobes.

Both lobes of the thyroid were enlarged and multilobulated, being divided by wide strands of connective tissue. There seemed to be an abundance of colloid throughout but the group collections of this substance were separated by an increased stroma. The isthmus was thickened and lobulated. Microscopically the entire gland was composed of large-sized colloid follicles surrounding which were epithelial cells bearing pale nuclei. There were no cellular hyperplasias or adenomatous responses, but it may be emphasized that the colloid in sum total was probably in excess considering the aged thyroid. A few small hemorrhages of recent origin were seen through the substance.

The pancreas was narrowed and discolored from post-mortem autolysis, but retained an exaggerated lobulation and showed a few small-sized hemorrhages. Microscopically the acinal cells were heavily stained showing no individual cellular elements, and the lobules were widely separated by fibrofatty tissue. Many large-sized globules of fat were seen separating the individual acini. The islands were very small and sclerotic showing cellular decreases. The vessels of the gland were arteriosclerotic and locally dilated.

The adrenals were large in size, both cortex and medulla being swollen, edematous and hemorrhagic. The cortex which was originally quite

generous in amount was light in color, showing much fatty alteration, and the medullary portion was very dark brown but not liquefied. Microscopically a marked cloudy swelling was present through all zones of the cortex, and the medullary substance was wide but very fibrous and congested, presenting in addition inclusions of swollen pale cortical cells. The outer thickened fibrous capsule had enclosed numerous irregular groups of hypertrophied zona glomerulosa cells, which were, however, in extreme stages of devastation. All vessels exhibited arteriosclerosis.

The left testicle was congenitally absent, and the right one was compensatory in size, the glandular substance appearing well preserved and the tubules elastic. Microscopically the interstitial supportive tissues were not generally increased but in patches the tubules were thickened with an occasional one totally obliterated from fibrohyaline production. The spermatogenic cells were very few in number and no mature spermatozoa were found in any of the sections. The interstitial cells of Leydig were small, heavily pigmented and the groups were thinly scattered, being rarely encountered.

I here emphasize such cases as the foregoing in order to account for many who do not fall entirely into the typical hypoplastic group with their early onset, tuberculosis, regressive sclerotic endocrine changes, and hypoplastic circulatory apparatus, in which true compensations are rarely if ever developed, but who nevertheless are precox in many clinical features and have certain clinical and pathologic features which may be interpreted as compensatory in nature. I do not wish to be misinterpreted in this attitude since I am convinced that the true precox has an inferior hypoplastic constitution without adequate compensatory possibilities as far as its chemical integrators are concerned, and tends to deteriorate with rapidity. But there are types showing some of the above features, which, however, tend to deteriorate slowly or to remain stationary, and who show by this somatic behavior as well as by mental characters that temporary adjustments have been made or in other cases more permanent adjustments or arrests in the disorder have occurred, thus allowing the usual life span to mature when the environment is either an inactive one or one protected from the usual vicissitudes. In keeping with this conception Cellier (52) would apply the term "dementia precox" only to the first mentioned group, *i.e.*, only to the Morel type—hebephrenia-catatonia of adolescents with a trend to rapid dementia. To him there is no dementia precox without this rapid mental impairment and its characteristic anatomy. He emphasizes that systematized delirium (paranoid trends), the incoherent delirium of degenerates, chronic confusional states, true delirium and schizoid states should not be classed as dementia precox.

The chemical panel has also received some attention by biochemists,

and while this field has not been strikingly productive, yet many suggestive results have been obtained, which when thoroughly worked out and applied may become well worth while. Before discussing some of these features it should be said that serology of the type used so effectively in diagnosing syphilis shows no special features in precox, nor is the precox make-up prone to contract syphilis, notwithstanding occasionally they are found associated. I agree with Greene (53) that the infrequency of acquired syphilis in dementia precox is by virtue of the reason that the dementia precox is primarily a shut-in personality, is seclusive, and his sex habits, conflicts and excitements take the form of onanistic or masturbatory excesses rather than promiscuous cohabitation, with its venereal risks. Moreover all attempts to prove that precox is a degeneration, the result of syphilis in the antecedents, have failed to accrue sufficient data for interpretation.

Among others who have studied precox from the chemical point of view Uyematsu and Soda (54) analyzed the blood from 32 cases of the catatonic variety, from which they concluded that there is no definite and absolute blood formula for the group but 75 per cent of the cases showed decrease in uric acid, these cases being mostly stationary types with poor peripheral blood circulation, and 47 per cent showed an increase in blood sugar. The most striking feature of this investigation was the fact that the average deviation of each constituent of "precox" blood was higher than the normal thus suggesting an unstable metabolic activity.

It was also shown by Gibbs and Lemcke (55) that the variations from normal in the basal metabolism rates were greater in dementia precox cases than in manic depressives. Some of their "precox" patients showed evidence of disturbed growth including sex maturity.

In 1918 I (56) demonstrated this striking variability to be the distinguishing feature of the blood sugar content of "precox" patients, this being true not only for these cases as a group, but for the individual patient both as to the usual sugar content and concerning sugar tolerance reactions. This variability I was inclined to interpret in terms of emotional variations in the personality of these distorted integrations. In this connection it may also be of some significance that Kritzing (57) has observed a tendency to periodic changes of the leucocyte count coincident and increasing with the restlessness of the patient. He noted as high as four such changes in one patient.

Raphael (58) after a many sided research into the physiochemical levels reached the conclusion "that there occurs in dementia

precox with essential consistency a definite hypoöxidative status physiologically with general metabolic depression and associated with vegetative features most marked in the acute unadjusted or exacerbative phases, and by that token probably reactionary or associative although no doubt frequently superimposed upon a structure initially vulnerable."

Walker (59) in his analysis of 28 cases of precox found a subnormal excretion of urea which he considered to be in part the result of diminished arterial tone. "The general nutrition in the majority of patients was good. There was no evidence of arteriosclerosis and hypertrophy of the left ventricle of the heart in any of the cases. There is, however, one point of clinical interest, especially when taken in conjunction with the per cent of urea in the urine in that the majority of the cases showing a subnormal arterial tension exhibited at the same time a low per cent of urea. This vascular hypotonus seems to offer a reasonable explanation not only for the low amount of urea in the urine but also for the tendency to polyuria."

According to Dawson (60) the chief physicochemical manifestations appear to be due mainly to disorders of the vegetative nervous system since in his series of fifty cases there was a high proportion of vagotonics, many of whom showed distinct adrenal inadequacy.

Essential deterioration which must indicate the hopelessness of further active treatment in these cases is very hard to distinguish from some of the more profound examples of emotional deviation in the same variety of reaction. Actual deterioration is obviously brought about or accompanied by diffuse productive lesions of the central nervous system, a variety of sclerosis in mesoblastic and neuroblastic structures which may be looked upon as permanent. From a practical standpoint it is impossible to determine in most cases just when this change which is certainly very insidious is sufficiently advanced to be considered as responsible for the cementing of the regressive vegetative symptoms, which then become structuralized and permanent. A profound temporary withdrawal from reality may appear clinically identical with deterioration, but for this reaction which at present can only be proved by waiting and observation I have offered the term "inverted emotional deviation."

Some day a great deal may be learned about the chemical aspect from the chemical analysis of tissues. Lately Slovtzov, (61) the Russian neurochemist, has been able to isolate thirty separate and distinct enzymes from normal untreated gray brain substance desiccated in a current of air. Should such researches be followed through the

nervous integrators of a large series of abnormal types, undoubtedly much valuable but at present unknown information would result, since here we have numerous possibilities of deviations and relative amounts among these and other constituents.

From the foregoing account of the somatic pathology of dementia precox as it appears at present any attempt at therapeutic reconstruction would seem futile. At any rate, it is obvious that any attack upon the problem should be initiated in childhood or very early in the disorder, which in turn depends upon early recognition of the condition. Psychotherapy in the form of psychoanalysis has been successful in many cases of schistic disorder, some of which have been closely allied with true dementia precox, but undoubtedly psychoanalytic studies on these cases have been far more productive from the standpoint of understanding the mental mechanism in action than from a more restricted therapeutic adjustment, although the latter is not to be discouraged in this connection. In a number of these cases it has been thought by some to have a deleterious effect. Tramer (62) calls attention to a pernicious introverting effect on patients with a strong tendency to ideational and emotional dissociations, but whether this is true or not, on the whole the cases must be selected with particular care if worth-while therapeutic results are to be expected. Much more space and time could be spent with profit in discussion of the relations of psychoanalysis and dementia precox, but we must hasten to mention a few other therapeutic attempts before closing the present review.

In outlining treatment for a case of dementia precox the problem as a whole must be given consideration. The physical machine, the functional derangement of viscera, the malnutrition of and damage to the brain, the polyendocrine sclerosis, and last but by no means least the psychogenic determinants and distorted mental factors in force—all these must be included in the program for readjustment. McCarthy (63) advises that (a) physical therapy, such as massage, gymnastics, and setting-up exercises, studied out and adapted to individual physical and mental needs; (b) postural therapy, the application of exercises to correct postural visceral defects; (c) disciplinary occupations applied with a view to disciplining the mental and physical habits, and constructive occupations utilized to stimulate the ambitions and aiding and leading to a more permanent extra-institutional adjustment—all be utilized in their appropriate indications. However, we do not entirely agree with McCarthy, who, after emphasizing that there is a psychogenic side needing treatment, closes the question by saying that "such readjustment is made almost

automatically during the progress of the treatment." Such may be true in some instances, but one could with safety make the reverse statement on the basis of experience: that when the psychogenic side of the disorder is successfully treated, the visceral and behavior twists become automatically untangled.

Walker (64) found that 50 per cent of dementia precox patients have a subnormal basal metabolism; in fact, an average rate of 20 per cent less than normal, which he explained by assuming that the lowered oxidation processes in the tissues may be due to hypofunction of the autonomic nervous system and not to thyroid disorder primarily, since the rate could not be raised by feeding thyroid. However, in the cases with remissions the basal metabolism approached the normal during the intervals. These findings induced him to apply to their somas a heat produced by the diathermic current, a variant of high frequency which he has here well described. The heat thus produced is endogenous and tends to increase the basal metabolism. Therefore it proved to be a useful adjunct in the physiotherapy of these cases.

Josephy, (65) who is one of those believing that dementia precox is regularly associated with changes in the cortex of the brain, and who found a destruction of the third and fifth layers of cortical neuron cells in patients with catatonic symptoms, insists that intramuscular injections of their own blood have a beneficial effect particularly in the acute stages—a type of treatment (autoserum) which has been applied in several varieties of chronic organic diseases with and without success.

Stimulated by the results produced in paresis by the malarial inoculation method, Templeton (66) treated twenty male "precox" patients according to that technic. There was no mental or physical reaction in the "paranoid" types, but there was marked improvement with extroversion in most all of the introverted types; this was sometimes preceded by a period of irritability. However, by the end of two months nearly all had relapsed, but a few of the most difficult ones to care for have retained the improvement for three months. He prophesies that all will return to their former state. Here the shock to the organism produces a temporary partial return to reality, a type of reaction similar examples of which abound in the older literature.

Carroll (67) has been treating cases of "precox" by the induction of aseptic meningitis, which is produced by withdrawing 20 c.c. of spinal fluid and replacing by an equal amount of inactivated horse serum. The temperature rises to 102.5°. The first treatment usu-

ally gives no results, but the course consists of three or four treatments given one week apart. Fourteen days after the first injection the spinal fluid cell count runs about 100 per cm., with 95 per cent monos and 4-6 per cent polys. Marked mental improvement has been noted in a few cases, the theory being that the surplus of phagocytes thus produced neutralizes the injurious toxins and exert a scavenger and reparative action on the brain tissue. Whether this theory is true or whether the reaction of improvement is one of the foregoing mentioned shock to reality phenomena remains to be determined after far more extensive research and prolonged observation, but naturally I am inclined to believe it is the latter, since there is no evidence as yet to indicate that dementia precox is a brain disease in the sense of primary destructive or exudative lesions. Perhaps in this same category should be placed the work of Page, (68) who has had good results with arsphenamin treatment in a selected group of patients. He attributed his good results to the fact that syphilis was proven to be present in the antecedents of his entire group.

Raitzin (69) has tried the Steinach rejuvenation method with negative results. Bleuler (4) insists that "precox" should not be treated outside an asylum, and outlines a new method of drug therapy. To acute cases he gives eight to twelve days of somnifen half-sleep, which sometimes produces excellent results. The technic is as follows: A hypodermic of hyocine 0.001 and morphine 0.01 is given; one-half hour later an ampule of somnifen (a proprietary compound) is injected in the arms; six to eight hours later another ampule is given, and so on until the patient is in a deep narcosis, which must be maintained for several days by ampules of somnifen as needed. The patient, when left alone, sleeps deeply, but can be sufficiently aroused to take nourishment or to go to the toilet. Moser (70) has published an article on the treatment of schizophrenia with continuous somnifen narcosis, and several other papers have appeared on its use in manic-depressive psychosis and other mental disorders by continental authors, principally German and Swiss, but as yet no experience with the drug has been recorded by American writers. Perhaps the good results from such a forced and profound regression of the total personality depend upon the laws of the unconscious concerned with the deeper regression method of settling difficulties from which the patient emerges reborn with less active conflict or on the other hand with more adequate and successful repression possibilities.

In the foregoing I have attempted to outline the facts as they stand at present, although personal prejudice has occasionally crept

in; but on the whole, perhaps I have been successful in indicating the various phases of the modern trends of thought concerning the problems of "precox" and how numerous investigators are attacking the chemical, physical, and psychologic aspects of these integrations. The organism and its environment must be considered as a totality, and those investigators who guard themselves against the ever present tendency to interpret partial reactions in terms of cause and effect will contribute greatly toward an understanding of dementia precox as well as toward the solution of many other similar problems.

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EXPERIMENTAL INVESTIGATIONS CONCERNING THE DOUBLE EFFECT OF CALCIUM ON THE VEGETATIVE NERVOUS SYSTEM

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The investigations of later years have given us a progressively clearer idea of the important rôle played by the electrolytes in the function of cells and organs. After the classical works of J. Loeb a series of works concerning the effects of electrolytes have proved that on surliving organs and in animal experiments certain electrolytes, as for instance Na, K, Ca, and Mg produce an effect remarkably resembling the effects produced by certain alterations of nerves. Already in 1906 Howell had shown that in experiments made with surliving heart the alteration of the vagus causes an increase in the K content of the transflowing liquid. A more exact conception of these phenomena was given lately by F. Kraus and S. G. Zondek; they developed a thesis, which says, that alterations of vegetative nerve activity are analogous to the effect of certain kations. An increase of Ca in the liquid surrounding the cells is analogous to an alteration of the sympathetic, the increase of K to that of the vagus. According to Zondek nervous effects and ion effects are analogous processes. The change in the kation concentration is the way by which the vegetative nervous system displays its peripheral function. The kations are the tools through which the nerve performs its function (Zondek).

This conception of Kraus-Zondek furnishes us a totally new point of view for the examination of the functions of the vegetative nervous system. As, however, this thesis, very important for physiology as well as for pathophysiology, is based chiefly on experiments made upon surliving organs, it is necessary that the kation effects should also be studied in experiments made upon man. It is generally known that not only experiments upon surliving organs, showing purely peripheral effects but also experiments made upon animals, furnish us results which cannot be transferred in every relation on man. The therapeutic use of calcium salts on the other hand gains a more and more widening territory in view of the above-mentioned conception.

Holding in view all that we have just said, we have made numerous experiments upon the effect of calcium on the vegetative nervous system of man. The subjects we used for these experiments were partly *sine morbo*, partly such patients who did not suffer from any consuming illness. Among the latter were such as might be supposed having a lability of the vegetative nervous system, such as gastric ulcer, exophthalmic goiter, and diabetes.

The method of our experiments was as follows: The experiments were made in the morning on hungering and resting individuals. Having registered the results of the oculocardiac test of Aschner and of the examination of adrenalin mydriasis, we examined the blood picture and measured the blood sugar of the patients. Together with observing the pulse rate and the blood pressure, we noted the wideness of the pupils, eventual dermatography, tremor, etc. After this the patients were given an intravenous injection of 5 c.c., in a later experiment after 10 days of 10 c.c., of a 10 per cent solution of CaCl_2 ; the duration of the injection was generally of about 30 to 40 seconds. After the injection we observed throughout 10 minutes, every minute, the pulse rate, the blood pressure and the effect of the oculocardiac reflex. The blood sugar was examined after 10, 25, 45 and 90 minutes. In the same interval we counted the blood picture, noted the pulse rate and the blood pressure, observed the result of the oculocardiac and adrenalin mydriasis test and the general symptoms resulting. The results of the experiments were then tabulated.

On the basis of these experiments we can outline the characteristic features of the effects of calcium on man as follows*: immediately after the injection—sometimes already during it—we observed a remarkable slowing of the pulse rate, which may go as far as 15 to 35 strokes in a minute. In some cases the pulse rate fell to 50 to 45 per minute. The results of Aschner's oculocardiac test becomes decidedly positive. If it was positive previously, the increase was marked and we found sometimes a lowering of the pulse rate of 20 to 15 strokes. The pupils often get a little smaller. The blood pressure values show a slight increase—10 to 20 hgmm. measured with Riva-Rocci's apparatus; often, however, one sees an initial depression. Greater increases of the blood pressure, as those described by Jansen, we have not been able to observe with the doses of calcium used by us. All the mentioned symptoms last only a short time. After 5 to 10 minutes the slowing of the pulse rate disappears and the previous pulse rate is reestablished. The Aschner test becomes negative. The value

* The more detailed description of the results of our experiments has appeared in different papers. See literature.

of the blood sugar rises a little, often after an initial depression. We often found a positive adrenalin mydriasis test. The pupils widen, the pulse rate and the blood pressure can increase a little. In the blood picture we have observed in most cases an absolute and relative polynucleosis together with a decrease of the number of the eosinophile cells.

Should we attempt an analysis of all the symptoms mentioned in this short description as appearing after the injection of calcium, we must come to the conclusion that we can by no means consider the beginning of the calcium effect as a period of excitement of the sympathetic nervous system. In this period we find a strongly expressed bradycardia of short duration and a strongly positive oculocardiac reflex and besides there is often an initial decrease of the blood sugar level and of the blood pressure. Jansen has observed in addition to the bradycardia a strong slowing and deepening of the respiration; he brought this latter symptom in connection with the depressive effect of calcium on the respiratory center. According to our observations the initial bradycardia has the following characteristics: the slowing of the pulse rate can be suppressed with atropine; previously given, atropine prevents its development. If we give 0.0005 gr. atropine sulfuricum in an injection before the calcium is injected, the slowing of the pulse rate will not appear. 0.0001–0.0002 gr. given intravenously at the summit of the calcium bradycardia will cause the bradycardia to disappear at once. All this proves that the bradycardia is bound to the normal functioning of the vagus apparatus of the heart. A very interesting paper from Billigheimer dealing with the resemblances of calcium to digitalis, which has appeared since our experiments were made, fully strengthens the results of our experiments.

We have maintained that *in contradiction to the results of experiments made on surviving organs the effect of calcium on men is manifested in a double reaction: in the initial period there are strongly expressed symptoms of vagus excitement of short duration and these are followed by a less strongly expressed period of sympathetic excitement with longer duration*—increase of the blood sugar and blood pressure, sometimes adrenalin mydriasis, etc.

After all these we are obliged to state the effect of calcium as an *amphotrop effect*, that is to say, as an effect which manifests itself on both parts of the vegetative nervous system. In the literature we find numerous examples also in other relation of such double effects. As for instance the paradoxical adrenalin effect—which shows an initial slowing of the pulse rate and a depression of the blood sugar—

is considered as an amphotrop effect, showing an initial vagus excitement, as may be seen in the studies of Friedberg, Schenk and Heimann-Trosieü, etc. Daniélopolu and his collaborators consider the effects of the vegetative poisons generally as one of double direction: the quality of the effect depends on the dosage.

According to our observations the components of the calcium effect can also appear in different intensity depending on the individual qualities of the organism. One might suggest that by means of calcium it might be possible to find different types of reactivity. Investigations in this direction we have in hand just now.

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THE HUMAN CEREBROSPINAL FLUID IN GENERAL SYSTEM AND METABOLIC DISEASES AS IN NEPHRITIS, DIABETES, ETC.*

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So little has been written, and so little is generally known about the spinal fluid in such conditions as diabetes mellitus, nephritis, jaundice, gout, and other similar conditions, that a review of the findings in these diseases is of distinct value. The cerebrospinal fluid findings in other diseases has been more thoroughly studied mainly because they are very often necessary to establish or corroborate a diagnosis. In the diseases with which this paper deals, the spinal fluid findings are probably not an indispensable aid in diagnosis, but in certain of the conditions they are of distinct value in determining the diagnosis and prognosis, and indeed the determination of the findings which occur in these conditions may be of value as an approach to further physiological studies on the cerebrospinal fluid.

Diabetes.—According to Mestrezat,(1) there are two findings of importance in the spinal fluid of diabetes; one is the presence of sugar in abnormal proportions, and the other is the presence of acetone. In all other respects, viz: in the number of cells, in the pressure, the albumen, and the gold curve the spinal fluid is essentially normal. We have used as the basis for the findings in the spinal fluid in diabetes mellitus, a study of 19 spinal fluids from various hospitals in the city of New York. An analysis of these 19 cases shows the cell count to vary from 1 to 7 cells in 11 or 60 per cent of the cases, and from 10 to 28 in 8 or 40 per cent of the cases, in 5 of these the cell count being 20 or over. In most of the cases in which the cell count was increased there was present a complication such as a neuritis, gangrene, bronchopneumonia, pulmonary tuberculosis, or a cerebral vascular lesion of some sort. In all cases except one the spinal fluid pressure was normal. In one case it was definitely increased. The protein content was not increased in 10 cases, while in 9 cases it was increased but slightly.

* Read before the Association for Research in Nervous and Mental Diseases, December, 1924.

TABLE I
SPINAL FLUID IN DIABETES

Author	Year	Number of cases	Sugar	Acetone	Cells	Albumen globulin	Pressure
Gruenberger.....	1905	1	5.2%	Present	0	None	110 mm.
Foster.....	1906	12	.5 to 3%	.....	.....	.....	.....
Derrien and Bousquet.....	1908	2	.9-1.8%	Traces to 0.22 gr.	0	.....	.....
Bousquet and Derrien.....	1910	5	.8-2.3%	Present	.....	.....	.....
Erben.....	1910	Not stated	0.3%	Present	.....	.....	.....
Mestrezat (Review of Literature, 1904-1912).....	1912	Not stated	.9-5.5%	Present	.....	.....	.....
Lochelougue.....	1918	Not stated	Very much increased	Present in coma	No formula	Increased	.....
Eskuchen.....	1919	Not stated	Increased	Present early and in coma	Normal or border line	Slightly increased	Not increased
Boyd.....	1920	Not stated	To 0.5%	Present in coma	.....	.....	.....
Levinson.....	1923	Not stated	To 0.38%	Late in disease	Not increased	Normal	Normal

In one case a protein content of 90 mgs. per 100 c.c. was found. In only one of the 19 cases was a quantitative sugar estimation made, this case having a sugar content of 175 mgs. per 100 c.c. The Wassermann reaction was negative in all cases. In 4 cases the colloidal gold curve showed reduction in the lower dilutions. All writers agree that the sugar in the spinal fluid is increased in diabetes, but the amount of increase is not a matter of unanimity. The sugar may be increased in amounts varying from 0.3 to 3 per cent, but may be even as high as 5-6 per cent. Acetone is usually present, some authors reporting it early in the disease, and some stating that acetone appears only in coma or immediately before coma. Diacetic acid has been found in only a few instances, and there only in coma. Bousquet and Derrien (2) report two cases of diabetes with acetone in the urine and spinal fluid before coma, and three cases in which acetone was found in the spinal fluid before it appeared in the urine. They therefore contend that the spinal fluid findings in diabetes may be of some value in the diagnosis of an impending coma in cases where no evidence of acidosis is present in the urine. Erben (3) also states that there may be acetone in the spinal fluid without an acetonuria. He found acetone in a series of comatose diabetics, in amounts as high as were found in the urine. He states that the spinal fluid examination is of importance in those patients who come into a hospital in a comatose state, and from whom no urine is obtainable. Mestrezat (1) states that before coma the sugar is increased from 0.9 to 2.7 and that in coma the sugar is very much increased, 2.2 to 5.5. He says that as the blood sugar returns to normal, the spinal fluid sugar reaches a normal level. He believes that the presence of acetone is not pathognomonic of diabetes, but that in a spinal fluid with a sugar over 0.9 per cent the presence of acetone confirms the diagnosis. He considers the acetone test as of importance in the differential diagnosis of coma. Frazier (4) found the presence of acetone a frequent forerunner of coma. Lochelongue (5) says that acetone is present in large amounts in coma, but may be met before coma. Eskuschen (6) agrees with the latter finding, but Boyd (7) declares that acetone is never found in the fluid except in coma. He says that the increase in the spinal fluid sugar closely parallels that of the blood, and that cases of coma show the highest amounts of sugar. Diacetic acid is found more rarely than acetone, its presence being indicative of the extreme gravity of the condition. He too lays stress on the value of the presence of acetone and sugar in the spinal fluid findings in a comatose patient from whom no urine can be obtained. It may therefore be that the spinal fluid

findings in diabetes have more than an academic value, and that they may serve in the differential diagnosis of comatose states, and may even be of value in determining the prognosis of certain cases of diabetes. We may probably state fairly definitely that in those cases of diabetes with definite evidence of an inability to utilize sugar, with an increase in the sugar content of the blood and the presence of sugar in the urine, that sugar will be found in the spinal fluid, but that the amount need not be proportional to the level of the blood sugar. In cases of impending coma and in cases with coma, acetone is usually present, and sometimes also diacetic acid. These substances are usually present in the severer stages of diabetes.

Nephritis.—The spinal fluid findings in nephritis vary with the presence or absence of uremia. In cases of chronic nephritis without uremia, the pressure is usually increased but may be normal and the cells are usually normal. Forty-one spinal fluids of cases of chronic nephritis from various hospitals in New York were studied. The type of chronic nephritis was not always stated, but most of the spinal fluids were from cases of chronic nephritis with hypertension. All the fluids were clear and colorless. In 34 or about 83 per cent of the cases the cell count was normal, varying from 0 to 5 cells. In 7 or 17 per cent of the cases the cell count was definitely increased: 4 of these cases had cell counts of 9 to 19, and 3 had cell counts of 50, 120, and 155. In one of these cases the patient died with a pneumonia, in another a hemiplegia was present to complicate the nephritis and in another Jacksonian epilepsy was present. No records of the pressure in this condition were available. In 12 or about 30 per cent of the cases there was a slight to moderate increase in the albumen and globulin content. In only 14 cases was a Wassermann reaction recorded, and in all these cases it was negative. Sugar was present but no quantitative figures were available. In cases of chronic nephritis with edema, Mestrezat (1) says that there is a marked increase in the chlorides of the spinal fluid. Boyd, (7) Levinson (8) and Eskuschen (6) also state that the chlorides are increased in these cases, often to 0.8 or 0.85 per cent. The urea content in cases of chronic nephritis without uremia is almost normal. Mestrezat (1) says it is usually below 0.1 per cent, but that in exceptional cases it may exceed this amount. Lochelongue (5) agrees with these, and places the urea content in chronic nephritis without uremia at 0.1–2.2 per cent. Von Monakow (9) reports the presence of uric acid and creatinin in increased amounts in the spinal and ventricular fluids of a case of chronic nephritis.

The presence of a uremia alters the spinal fluid findings. Mollard

and Froment first used the classification of "pure" and "associated" uremia, and this classification has been accepted by most writers on the subject. By a pure uremia is meant a uremia without known cause, and by associated uremia is meant a uremia with some secondary cause which is producing the uremia. In a pure uremia the cells are occasionally increased according to Mestrezat (1). The pressure is increased almost constantly, and there is an increase in chlorides, the urea content is elevated, and some authors report an increase in the sugar content, Lochelongue (5) stating that the more grave the uremia, the higher is the sugar content. While all writers agree that the urea content is increased in pure uremia, the figures vary with various writers. Mestrezat (1) gives 0.4–2.55 per cent as the variations in the urea content in pure uremia, Canti from 0.098–0.634 per cent, and Boyd (7) 0.1–0.6 per cent. In any event, the urea is definitely increased.

In cases of "associated" uremia, the amount and pressure of the spinal fluid are increased, the cells are usually normal, but there may be a lymphocytosis, the albumen is increased, and the chlorides are reported to be definitely elevated. The urea content of these spinal fluids is very much increased. Canti (10) reports the urea content to be 0.1–0.764 per cent, Levinson (8) says the urea content may be as high as 55 mg. per 100 c.c., Boyd (7) says the urea is present in amounts varying from 0.1 to 0.6 per cent, and Eskuschen (6) and Lochelongue (5) says that the urea is as high as 1–2 per cent and may even be as high as 4 per cent. Lactic acid is usually found in large quantities in the spinal fluid in cases of eclampsia.

Soper and Granat (11) have drawn certain conclusions as to the prognosis of cases of uremia, based on the amount of urea in the spinal fluid. They say that a urea content of more than 0.2 per cent indicates a severe uremia and a rapidly fatal termination, that a content between 0.1 and 0.2 per cent means a rapidly fatal termination in most cases of nephritis, and that a urea content of 0.05–0.1 per cent permits of no definite conclusions of prognosis or diagnosis, but that such a content is suggestive of severe urea retention. Mollard and Froment (12) on the basis of 23 cases state that a urea content of 0.4 per cent meant a pure uremia, and foretold a rapidly fatal outcome. A urea content below 0.4 per cent did not permit any definite conclusions. Froment (13) on the basis of 34 cases came to the same conclusions, and also stated that in cases with less than 0.1 per cent urea the diagnosis of uremia could be rejected. Canti (10) says that "every case in which a greatly increased quantity of urea has been found in the cerebrospinal fluid has proved fatal within a short

period." In short, the urea findings may serve as a very definite means of determining both prognosis and diagnosis in cases of "pure" and "associated" uremia.

Jaundice.—Except for the inconstant presence of a yellow discoloration to the fluid, the spinal fluid in jaundice is usually normal. Magendie in 1827 demonstrated that the spinal fluid in jaundice shows a more or less pronounced yellow color. The intensity of the coloration varies, at times it is very yellow, at times slightly xanthochromic, and at times it is colorless. Authors differ on the incidence of this coloration, some reporting it in every case, and others only in 15 per cent of the cases.

Mestrezat (1) reports four fluids, three of which were yellow. It is certain that not every spinal fluid in jaundice is discolored, and that from the statistics at hand the incidence of the discoloration may be placed at from 20 to 30 per cent, these figures varying of course with the intensity, duration, and cause of the jaundice. Levinson (8) says that "the color of the fluid is deep yellow." Loche-longue (5) however asserts that the color is but slightly different from the normal, is at times yellow, and that there is no parallel between the color of the fluid and the gravity of the clinical case. Bile is demonstrable in the spinal fluid in cases of jaundice with a yellow fluid, and Mestrezat (1) says that this coloration is due to urobilin. A decrease in chlorides has been reported in the spinal fluid, in jaundice, and a few cases have been reported with an increased spinal fluid sugar. The pressure, cell content, and albumen are all usually normal.

Gastroenteritis.—In 69 spinal fluids from cases of gastroenteritis which were studied no striking findings were noted. In 13 of the cases an increased cell count was found, usually varying from 20 to 50, but in one case reaching 210. The cells were chiefly lymphocytes, but polymorphonuclear cells were present in many of the cases. All the fluids were clear, and none of them showed an increase in the pressure. The albumen and globulin content were normal in practically every case. The colloidal gold and Wassermann reactions were not done with any degree of uniformity, so that no conclusions are available in these tests. Qualitatively, sugar is present in every case, sometimes in amounts which would probably show an increase over the normal if quantitated. One case of an acute catarrhal jaundice of two weeks duration showed no discoloration and no bile in the spinal fluid.

Gout.—Very few studies have been made on the spinal fluid in this condition. Charcot reports the presence of urates in a spinal

fluid from a case of chronic gout, and Mestrezat (1) states that one of the manifestations of the gouty diathesis may be the presence of urates or of uric acid concretions in the meninges or spinal fluid.

CARDIAC DISEASES

Chronic Endocarditis.—Seventeen cases of chronic endocarditis were studied. In 11 cases the disease process involved the aortic valves, and in 6 cases the mitral valves. In the cases of aortic disease, 3 were cases of aortic stenosis, and 8 were cases of aortitis or of aortic regurgitation. In 10 of the cases of aortic disease the cell count was normal, never rising higher than 5. In one case which showed evidence of a general arteriosclerosis the cell count was 12. In every case the globulin and albumen content was normal. The Wassermann reaction was negative in every case. No conclusions could be reached with regard to the colloidal gold reaction. Fehling's solution was reduced in every case. In the 6 cases of mitral endocarditis (mitral stenosis) the spinal fluid findings were normal in every detail.

Chronic Myocarditis.—Five cases of chronic myocarditis showed spinal fluid findings with no variation from the normal.

Subacute Bacterial Endocarditis.—Eleven cases of this disease showed clear fluids in every case. In four cases the cell count was increased in amount; in 7 cases it was normal. In 5 cases the albumen and globulin was moderately increased; in 6 cases it was normal. Fehling's solution was reduced in every case. No observations were made on the colloidal gold or Wassermann reactions. The spinal fluid in this condition shows no typical findings, and in most respects may be said to be normal.

INFECTIOUS DISEASES

Pneumonia.—Sixty-four spinal fluids from cases of pneumonia at various New York hospitals were studied. Of these, 21 fluids were from cases of lobar pneumonia, 18 were from cases of bronchopneumonia, and 25 were the spinal fluids of pneumonia cases with signs of meningismus. In the series of 21 cases of lobar pneumonia without signs of a meningismus or meningitis, the fluid was clear and colorless in every case. In 18 or 85 per cent of the cases the cell count varied from 0 to 8 cells, and in 3 cases the cell count was increased, viz: 50, 11, and 96. In none of these 3 cases could a complication be found which might possibly explain the increase in the cellular content. The cells were almost without exception, lymphocytes. The albumen and globulin content was qualitatively

normal, but in some cases showed a slight increase. The Wassermann reaction in 5 cases was negative. Cultures in 7 cases showed no growths. Fehling's solution was reduced in all cases in which sugar was tested.

In 18 cases of bronchopneumonia, 6 cases or 33 per cent showed an increased cell count; 4 of these cases showed a cell count of 10, one had a cell count of 120, and one of 250, but this latter case was complicated by an encephalitis. In 12 or 66 per cent of the cases the cell count was perfectly normal. The globulin and albumen tended to be normal in most cases, but in 5 fluids showed a definite increase. The Wassermann reaction in 2 cases was negative. No conclusions could be drawn with regard to the colloidal gold reaction. Cultures of 10 spinal fluids were all negative.

When we come to the 25 cases of pneumonia with signs of a meningismus, we find that the findings are no different from cases without signs of meningeal irritation. In all the cases except 2 the cell count was normal. In one case it reached 227 in a case of acute lobar pneumonia with a meningismus; in another case the cells were 17 in number. The albumen and globulin content was normal. Cultures were always negative when done, and the Wassermann reaction was entirely negative. Qualitative tests for sugar always showed a reduction.

Blatteis and Lederer (14) reported perfectly normal spinal fluid findings in cases of pneumonia with signs of a meningismus, in contrast to definitely pathological findings in cases of pneumococcic meningitis with which this paper does not deal. Rohdenburgh and Van der Veer (15) studied 145 cases of pneumonia irrespective of the occurrence of meningeal symptoms, and found essentially normal fluids in nonmeningitic cases. Mestrezat reports 4 cases of pneumonia without signs of a meningitis. In these, two showed very high pressures, all were colorless, the cell contents were normal, and the albumen, sugar, and chloride contents were not increased. Loche-longue (5) remarks that the spinal fluid in pneumonia is normal save for the sugar content which is generally increased. With this latter observation, however, few authors agree.

Our conclusion is that the spinal fluid findings in pneumonia, as *shown only by the routine tests*, are normal. This is true of lobar pneumonia and bronchopneumonia whether with or without signs of a meningeal irritation. The only variable sign is the cell count which is usually normal, but may be increased, more frequently in bronchopneumonia than in lobar pneumonia. Blatteis and Lederer (14) report the number of cells as 2-3 lymphocytes per c.mm.

while Rohdenburgh and Van der Veer (15) report the average cell count in recovered cases of pneumonia as 50 per cubic millimeter. In cases with a definite increase in the cellular content it is well to seek some complication of the pneumonia. In all other respects the spinal fluid is normal. Very few observations have been made on the colloidal gold curve in this condition and no conclusions can be drawn from the material at hand. The chlorides are normal in amount, but the sugar content of the spinal fluid has been reported as increased.

Typhoid Fever.—Mestrezat (1) reports 7 cases of typhoid fever in which the pressure was increased in three cases, the other showing a normal tension. The fluids in six cases were perfectly clear but one showed a slight xanthochromia. The albumen was normal in 4 cases; two showed an increase to 0.25 and 0.32 per cent, and one showed an increase to 2.10. The chloride content was normal. Mestrezat (1) laid stress on the hypoglycorrhachia of the spinal fluid in typhoid fever, and remarked that it was similar to the leucopenia of the blood. As regards the diagnostic value of the spinal fluid findings in typhoid fever, he stated that the decrease in chlorides measures the amount of the meningitic reaction, and that an increase in the albumen content signified either grave intoxication or infection of the meninges. Blatteis (14) reports 15 cases of typhoid fever with clear fluids. Lochelongue (5) states that the cells are normal in typhoid fever. The sugar is increased only in cases with renal complications or with profound intoxication. Rosenbloom and Andrews report one case of typhoid fever with an increased potassium content in the spinal fluid. On the basis of these few cases it is hard to draw conclusions, but one may say that in typhoid fever the pressure is normal or increased, the albumen while usually normal may be increased, the chloride content is normal, the sugar is decreased, and in one case reported the potassium content was increased.

Tuberculosis.—Thirty-two cases of tuberculosis were studied. Of these, 7 were cases of miliary tuberculosis, 23 were cases of chronic pulmonary tuberculosis, and 2 were cases of tuberculosis of the peritoneum and fallopian tubes. All the fluids save one were clear and colorless; one fluid was amber in color. Sixteen fluids or 50 per cent had a normal cell count. In 16 others or 50 per cent there was a definitely increased cell count ranging from 10 to 400. The average level of the increase varied from 20 to 40. In 7 cases the albumen and globulin content was slightly increased, but in all the other cases these constituents were normal. Cultures in 15 fluids

were negative. No conclusions could be drawn concerning the Wassermann and colloidal gold reactions.

Diphtheria.—The few fluids which have been examined in this condition have been essentially normal. Ravaut reports the albumen content normal or increased. Crisafi reports an increase in the chlorides. The sugar content is normal. Ravaut, (16) in a case of diphtheria paralysis of the pseudo-paretic type, found a marked lymphocytosis.

Malta Fever.—The spinal fluid in this condition is normal. Lochelongue (5) states that the sugar is always increased, and that a lymphocytosis is usual after infection of the subarachnoid cavity. In all other respects there is no deviation from the normal.

Tetanus-Influenza.—The spinal fluid studies in these conditions show no deviation from the normal.

Endocrine Disturbances.—Very few studies have been made on the spinal fluid in these disorders. Three cases of hyperthyroidism showed normal spinal fluid findings. One case of hypothyroidism and one case of hypopituitarism showed no abnormalities. Bousquet and Derrien (17) report the presence of acetone in the spinal fluid in the terminal portion of a case of Addison's disease. A case of acromegaly reported by Mestrezat (1) shows a normal spinal fluid. Two of our cases of acromegaly showed interesting findings. In one case everything was normal save the protein and sugar findings which were 61 and 130 mgs. respectively. Two examinations of another acromegalic fluid showed a xanthochromia on both occasions, 5-6 cells, a quantitative protein of 313 and 475 mgs., and a sugar content of 200 and 222 mgs. This latter case, however, was complicated by diabetes.

TOXIC CONDITIONS

Acute Alcoholic Intoxication.—In this condition the amount and pressure of the spinal fluid is increased. Alcohol can be recovered in the spinal fluid, the amount varying from 1.5 to 4 per cent and is higher than the alcoholic content of the blood. There is a slight increase in the albumen content. The cell content is usually normal, but Levinson reports an occasional count as high as 26 per cubic mm. The chloride and sugar content is normal.

Chronic Alcoholism.—The spinal fluid is normal in this condition.

Delirium Tremens.—Diacetic acid and acetone have been reported in a few spinal fluids in this condition, but in all other respects

the fluid is normal. Alcohol is not present unless it has been ingested within 24 hours before the fluid is taken.

Lead Poisoning.—In cases which have an involvement of the meninges the spinal fluid pressure is increased to 400 or 500 mm. of water. The amount of fluid is increased, and there is usually a lymphocytosis, the cells varying in amount from 50 to 250. Lead is often found in the spinal fluid in these cases.

MISCELLANEOUS CONDITIONS

Myeloid Leukemia.—Barker (18) reports one case of myeloid leukemia in which the cell count was 267. The cells were neutrophilic myelocytes and perhaps also myeloblasts. The globulin was slightly increased, but in other respects the fluid was normal. He reports also three spinal fluids from the literature, but none showed the presence of myelocytes. Bassoe (19) reported a case which showed a normal spinal fluid. Topie and Cassar (20) and also Munro (21) reported cases with a normal fluid.

Osteomalacia.—Barker and Cloudh punctured a case with osteomalacia, but found no abnormal findings save a slight change in the mastic reaction (2210000000), and a spinal fluid sugar of 0.76 per cent.

SUMMARY AND CONCLUSIONS

The basis of this paper is formed by a series of cerebrospinal fluids which have been collected from the literature and from hospital reports in New York and Philadelphia. Only those reports which have made a systematic and thorough investigation of the cerebrospinal fluid in certain conditions have been admitted into this report.

In diabetes mellitus, 19 spinal fluids were studied from our own reports, and 46 cases were collected from the literature. An analysis of our own cases seems to demonstrate clear fluids in every instance. In 60 per cent of the cases the cell content was normal, and in 40 per cent either moderately or definitely increased. Most of the cases with an increased cell count however showed the presence of some complication such as gangrene, tuberculosis, or pneumonia. The spinal fluid pressure is normal, and the protein content shows a slight increase in about 45 per cent of the cases. That the sugar in the spinal fluid is increased, is agreed upon by most authors, but the amount of the increase is not a matter of unanimity. One may safely say that it is increased in amounts varying from 0.3 to 3 per cent, the amount of the increase being proportional to the severity of the disease, and probably also to the level of the blood sugar. In none

of our cases has the spinal fluid sugar been higher than the blood sugar. Acetone is found in the spinal fluid in diabetes. Some authors report it in coma only, while others state that it is present as a diagnostic sign preceding coma. It has been advocated as a sign of considerable importance in determining the cause of a coma in patients who enter a hospital from whom no urine specimen is obtainable. By some authors acetone in the spinal fluid has been reported before the presence of an acetonuria, in this way prognosticating the onset of coma unless treatment were undertaken. The presence of acetone is probably a good indication of a severe intoxication or else is a reliable sign of an impending coma. It is present in largest amounts in coma but in our belief is also present before coma. Diacetic acid is reported also but only in the severest cases of coma.

Forty-one spinal fluids from cases of chronic nephritis without the presence of a uremia showed clear and colorless fluids in all cases. Most of these were cases of nephritis with hypertension. In 83 per cent the cell count was normal, and in 17 per cent it was definitely increased, so that one might conclude that an increased cell count in this condition is not impossible. One might add however that in the few fluids in which an increased cellular content was found, one died shortly after with a pneumonia, another had a hemiplegia, and a third had attacks of jacksonian epilepsy. Pressure records are not available in all cases but when recorded were definitely increased. In 30 per cent a slight to a moderate increase in the protein content was recorded. The Wassermann, when done, was always negative. In cases of chronic nephritis with edema, an increase in chlorides has been reported, and one author reports uric acid and creatinin in the ventricular and spinal fluids of a case of chronic nephritis.

In uremia the spinal fluid changes are different from those in nephritis. We base our studies on 98 collected cases from the literature. In "pure" uremia the pressure is always elevated, the urea content is increased, and by some authors an increase in the sugar and cells has been recorded. The amount of increase in urea is variable. In cases of "associated" or "secondary" uremia the amount and pressure of the spinal fluid are definitely increased, the cells are usually normal but may be increased, the chlorides are increased in amount, the albumen content is qualitatively normal and the urea content is elevated. Cases with a content of over 0.2 per cent are rapidly fatal, and those with a content of 0.1-0.2 per cent show a severe retention and a fatal termination if not cared for.

In jaundice the spinal fluid is occasionally yellow, probably in 15-20 per cent of the cases. A decrease in chlorides has been

reported, and a few cases with an increased sugar content. No other abnormalities were noted.

Sixty-nine cases of gastro-enteritis showed no abnormalities in the spinal fluids.

Urates and uric acid crystals have been reported in gout. No other findings are reported.

Cases of chronic endocarditis, chronic myocarditis, and subacute bacterial endocarditis show no deviation from the normal in their spinal fluid findings. An occasional increase in the cell count is the only finding reported. Our conclusions are based on a study of 33 cases.

In 21 cases of lobar pneumonia without signs of a meningismus an increase in the cell count was noted in 13 per cent of the cases. In 18 cases of bronchopneumonia the cells were increased in 33 per cent of the cases. No other significant findings were noted. Twenty-five cases of pneumonia with signs of meningismus showed normal spinal fluid findings.

In typhoid fever a hyperglycorrhachia had been reported, and also a decrease in chlorides.

Fifty per cent of the cases of pulmonary tuberculosis showed an increased cell content, but no other findings.

Endocrine disorders were studied but no conclusions could be drawn from the few cases available for study.

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A CASE OF CERVICO MEDULLARY TUMOR *

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A married woman, age twenty-nine, entered Cook County Hospital August 17, 1924. During her life she had been entirely free from any serious illness until April 1 of that year. At that time she had a severe cold.

On April 25, after being frightened by a drunken man, she noticed definite weakness of the whole left side of the body but especially marked in the arm. She had what she described as a "pinching pain" in the left side and arm which lasted two days, then disappeared, but returned a month later. Generalized weakness gradually progressed until July 15 when she went to bed quite helpless. She was unable to hold up her head and had a severe headache for a few days. She stated that there was a "pulling sensation" in her stomach for two weeks after this. During the week before entrance she had complete loss of all motor power below the neck. At times she had pain all over her body, worse in the back of her neck. Sometimes there was numbness of the arms and legs and one day she had a sensation of choking. There had been no difficulty in swallowing, no visual disturbance, no disorders of taste or smell, no vertigo, tinnitus, nausea, vomiting, tremors, spasms or convulsions. There had been no evidence of mental disturbance.

General physical examination on entrance showed temperature 98, pulse 120, respiration 22, blood pressure systolic 120, diastolic 95. Heart and blood vessels showed no abnormality. Nose appeared normal. Tonsils were hypertrophied and pharynx injected. Respiration was shallow and of intercostal type. There was diminished resonance at the base of the right lung posteriorly with diminished breath sounds. No rales were heard. The thorax was symmetrical but flat. Many teeth were missing but the remainder were in fair condition. The abdomen showed no areas of tenderness or rigidity. The liver, spleen and kidneys were not palpable. Bladder was distended up to the umbilicus. There were no enlarged lymph nodes. The thyroid was normal. The skin was pale and general nutrition poor. Vaginal examination was not made.

Neurological examination was as follows:

Body. Motor: She lay perfectly helpless in bed on her back with arms and legs extended. Gait, skilled acts, and coördination could not be tested. There were no abnormal involuntary or abnormal associated movements. All

* Read before the Chicago Neurological Society, December 18, 1924.

muscle power was gone. Both upper and lower extremities were extremely spastic on passive movement. Fingers of both hands were held in flexion with thumbs flexed and adducted. There was marked atrophy of the small muscles of both hands. The muscles of the throat, the upper part of the chest wall, and the deltoid muscles were all atrophied. Atrophy was present but less marked in the lower extremities. There were no palpable or abnormally tender peripheral nerves.

Reflexes: The biceps, triceps and radial tendon jerks were all very exaggerated. The patellar and Achilles jerks were both exaggerated with clonus. There was a bilateral Babinski sign. No abdominal reflexes were obtained.

Sensory: At the first examination there appeared to be indefinite disturbances of sensation in limited shifting areas. These findings were uncertain and slight and could not be charted.

Head. Cranial Nerves: The cranial nerves were essentially negative throughout. Ophthalmoscopic examination showed normal fundi. The face was somewhat expressionless but all the motor power was present.

Scalp and Skull: No abnormality was made out.

Mental: No definite abnormality was noted.

Laboratory. Spinal fluid was under normal pressure, clear, and with negative benzidine and Pandey. Through a mistake no cell count was made. The Wassermann was negative in the spinal fluid and in the blood. A roentgenogram of the cervical spine showed no abnormality.

Course. During her week in the hospital there was a gradual increase of the tendon reflexes and clonus on the right. No Kernig sign developed. The arms lost some of their rigidity. Peculiar sensory phenomena were noted as follows: burning all over except the face, "sensation of wind blowing out of left leg," loss of pain sense below the head, pain on moving the head to the left and flexing it forward, diminution of position sense in the legs. Toward the last there developed difficulty in swallowing, excessive secretion of saliva, involuntaries, and delirium. She died on August 25.

Diagnosis. A cervical Pott's disease was, of course, considered early but ruled out by the roentgenogram. The patient clinically strikingly resembled a case of amyotrophic lateral sclerosis. A rapid onset together with subsequent sensory phenomena naturally ruled this out. Our final clinical diagnosis was an incomplete transverse cervical myelitis of unknown origin.

Necropsy. This revealed a tumor opposite the lower portion of the medulla in a right ventrolateral position. It lay beneath the dura to which it was adherent. It was about the size of a hen's egg and reached the lower surface of the cerebellum on which it pressed, leaving a marked concavity but without adhesions. It was covered throughout by greatly thickened dural membrane and markedly pressed on the medulla and adjacent upper portion of the cervical cord. It projected somewhat through the foramen magnum. Below the olivary bodies the medulla showed a marked constriction. (Fig. 1.) Microscopic sections stained with hematoxylin-eosin, toluidin blue, Weigert-Pal and Alzheimer-Mann methods revealed no signs of secondary degeneration or any other changes in the gray and white substances below the lesion. The ganglion cells preserved their shape, size and form throughout the entire cervical region. Many cells showed abundance of yellow pigment and the

processes—axones and dendrites—were quite densely stained. The glia tissue showed no progressive or regressive changes but the gray substance of the anterior and especially posterior horns, showed an abundance of glia nuclei and an enormous vascularization. The pia in some areas exhibited slight infiltrative phenomena while the dura showed no changes except a marked hyperplasia over the tumor. This proved to be an endothelioma. Findings outside the nervous system included passive hyperemia of the lungs and liver bladder distended with urine, bilateral cysto-uretero-pyelo-nephritis, subacute verrucous endocarditis and slight acute hyperplasia of the spleen.

COMMENT

Cases similar to the foregoing are very uncommon in the literature. The following case reported by Müller¹ bears a striking resemblance.



FIGURE 1. Antero-inferior view of cerebellum, pons, medulla and upper cervical cord with tumor lying against right cerebellar hemisphere.

A woman, sixty-two years old, feeling entirely well and without any prodromata, suddenly developed a paralysis in the right arm and leg. During the next six months the phenomena receded, leaving but a slight weakness in the right arm. Ten months after the onset both lower extremities became paralyzed. This was followed within the next few weeks by an increasing paralysis of both upper extremi-

¹ Müller, A. "Ein Fall von Rückenmarkstumor im obern Cervikalbereich." *Deutsche Zeitschrift für Nervenheilkunde*, 1921, Vol. 71, p. 183.

ties. There was no pain, no speech difficulty, and no sphincter disturbance.

The examination showed no bulbar or ocular disturbances. There was paralysis of arms and legs, hypertonicity of lower extremities, marked atrophy of the deltoids, and other muscles of the shoulder region as well as of thenar, hypothenar, interossei, and extensor muscle groups of the forearm. Breathing was difficult. Tendon reflexes were all exaggerated with bilateral ankle clonus and Babinski. There were no fibrillary twitchings or degenerative changes. There were no sensory disturbances. Spinal fluid gave a strongly positive Pandy and a negative Wassermann.

No diagnosis could be made. An abnormal amyotrophic lateral sclerosis was considered but absence of fibrillary twitchings, absence of reaction of degeneration, and the acute type of the onset spoke against this diagnosis. The Mills-Spiller type of pyramidal tract degeneration was also considered.

Autopsy showed a tumor 6 cm. beneath the origin of the medulla and within the dural sac of the spinal cord. It was situated on the anterior surface of the cord and was the size of a cherry. It had exerted considerable pressure as the cord appeared flattened. There was descending degeneration of the pyramidal tract. The tumor was an endothelioma of the dura. The absence of sensory disturbances might be explained by the unusual localization. This together with the atrophies and the remission in the motor phenomena were the points of especial interest.

A case reported by Abrahamson and Grossman² is also similar.

A woman without important previous history, two and one-half years before admission, had severe pains in the left mastoid and occipital regions. There followed numbness, weakness and stiffness of the left leg. The right leg was later affected in the same way. Three months before admission the left arm became weak and one month later the right arm weakened. Bladder and respiratory difficulties followed.

Examination showed quadriplegia. Diaphragm movement was limited. Cranial nerves were normal except for a lateral nystagmus. There was generalized atrophy of the upper extremities without fibrillary tremors. Deep reflexes were all exaggerated. There were no abdominal reflexes and bilateral signs of pyramidal tract involvement were present. Sensory changes were principally on the right involving paralysis. Post-mortem examination showed a neuroma of the left

²Abrahamson, I., and Grossman, M. "Tumors of the Upper Cervical Cord." *JOURNAL OF NERVOUS AND MENTAL DISEASE*, 1923, Vol. 57, p. 342.

ing pain and temperature. Operation for a tumor at the level of the fifth cervical revealed no growth. Death occurred from respiratory occipital nerve extending anteriorly into the foramen magnum. It was attached by a pedicle and compressed the upper three cervical segments.

Probably the chief point of interest in our case and the two others quoted lies in the presence of atrophy of the upper extremities resulting from lesions exerting pressure well above the levels of the cervical cord which supply the muscles of the arm. In our case microscopic examination showed normal anterior horn cells at these levels. Therefore, these atrophies must have been caused by injury to anterior roots in some mechanical way. This could have been by either (1) torsion of the cord, (2) traction on the cord when the tumor grew and met the resistance of the foramen magnum, or (3) direct tearing when the dural sac was displaced away from the cord by growth of the tumor.

SOCIETY PROCEEDINGS

NEW YORK NEUROLOGICAL SOCIETY

THE FOUR HUNDRED AND TWENTY-FIRST REGULAR MEETING, JUNE 2, 1925. THE PRESIDENT, DR. I. ABRAHAMSON, PRESIDING

A LANTERN SLIDE REVIEW OF SOME UNCOMMON NEUROPATHOLOGICAL FINDINGS

Dr. Joseph H. Globus showed a large series of lantern slides. A number of them illustrated some unusual features in a series of well known pathologic conditions of the central nervous system, such as the various stages in the development of a solitary tuberculoma or multiple tuberculomata, the morphologic differences between a tubercle and a gumma, the almost constant coexistence of a more or less marked diffuse meningo-encephalitic process in the so-called basilar tuberculous meningitis, and the various phases in the development of luetic meningo-encephalitis.

In another group of slides various glial reactions were shown with particular reference to the various stages of "rosette" formations in their relation to neuronophagia and focal mobilization of glial elements.

Finally, a number of slides illustrating unusual features, peculiar cell forms and glial changes in some uncommon diseases of the central nervous system were also shown. This group included tuberous sclerosis with localized tumor formation; juvenile paresis; amaurotic family idiocy, and progressive subcortical encephalopathy, the latter a striking degenerative disease process limited to the white substance of the brain only.

ALCOHOLIC INJECTIONS INTO NERVE TISSUES FOR THE RELIEF OF PAIN

GEORGE I. SWETLOW, M.D. (by invitation)

In the following series of cases pain was the dominating feature. The relief obtained by means of alcoholic injections into nerve tissues was so marked that its use as a therapeutic measure may be highly recommended and widely used.

Ranson, in his original researches on peripheral nerves, showed that a sensory peripheral nerve is made up of both myelinated and unmyelinated fibers and that the unmyelinated fibers carry the pain-bearing influences (protopathic). Since these fibers are peripheral arms or projections of cells situated in the dorsal ganglia, it is quite evident theoretically that the destruction of these peripheral arms

would interrupt the pathway of the afferent stimuli and thus prevent the influx of pain stimuli to the sphere of consciousness.

The unmyelinated axones take their origins from the small cells in the dorsal root ganglia, while the myelinated ones originate from the large cells. The introduction of alcohol into a nerve produces an axonal degeneration with involvement, mostly of the small cells. The injection of 80 per cent alcohol not only destroys the sensory component, but also the motor component. The injection of a 60 per cent solution of alcohol, however, produces only slight transitory motor weakness. The axonal degeneration, however, of the afferent fibers and ganglia is at the same time quite extensive. The pathological change found in a nerve and its ganglion cells following the injection of alcohol is the same as though the nerve itself had been cut. The microscopical picture is also a Wallerian degeneration.

All of the following cases were examined by the attendings on their respective services: (1) Laryngeal tuberculosis; (2) Pleurisy; (3) Several forms of headaches; (4) Tabes with gastric crisis; (5) Cardiac disease; (6) pruritus ani.

Thirteen cases of far advanced pulmonary tuberculosis with agonizing laryngeal pain were treated by the injection of a 60 per cent solution of alcohol into the superior laryngeal nerve. Complete relief was obtained. The periods during which the patients were relieved ranged from nine days, ninety-six days and to the day of the reading of this paper.

The following is a summary of the cases reported: (1) The injection of alcohol into the superior laryngeal nerve for the relief of pain is anatomically and physiologically rational; (2) The injection of alcohol relieves pain for several weeks at least; (3) Difficulty in swallowing due to pain is often completely relieved; (4) Cases that have difficulty in swallowing, which is not due to laryngeal pain, are to be rejected in this treatment. One cannot expect results in this class of patients; (5) The procedure properly done is free from danger, and is practically painless; (6) The injection can be repeated if necessary; (7) This method has a definite and important rôle in the treatment of pain in tuberculosis of the larynx.

Five cases were presented as a preliminary report of an apparently new application of alcoholic injections into nerve tissue for the controlling of severe thoracic pain caused by pleuritic involvement. A careful search of the literature for any reference to this method has up to date revealed no record of its previous use.

The cases treated are suffering from far advanced pulmonary tuberculosis with pleural involvement. The pain was severe in character. The duration of their complaints dated from five weeks to five months. Following the paravertebral injection with alcohol they were relieved. The duration of relief ranges from thirty-five days, one hundred and seven days and to date.

Two cases of severe headache due to involvement of the great occipital nerve were treated with injection of alcohol into these nerves. The cause of the neuralgia was due to a cervical spondylitis.

The duration of relief extends over a period of seven to twelve weeks and to date.

One case of agonizing gastric crises was treated by means of paravertebral injection of alcohol into posterior roots of the fourth, sixth, and eighth dorsal segments on the right side and the third, fifth, to seventh on the left side. The patient had been in extreme agony for nineteen days. It is now a period of seven weeks that he is completely relieved.

One case of cardiac pain due to aortitis and aortic insufficiency on a luetic basis was treated. The complaint concerning pain dated back two years. Following the paravertebral injection of alcohol into the roots of the fourth, sixth and seventh dorsal nerves, the patient is greatly relieved. It is a period of seven weeks now to date that she is comfortable. The result possibly indicates the course of the pain stimuli in angina pectoris.

One case of severe pruritus ani was treated with the injection of 75 c.c. of a 20 per cent alcohol solution into the epidural space. The patient had been suffering intensely for three years and was relieved by no form of treatment. Following the alcoholic injection he registers no complaints concerning this symptom. It is a period of eighteen days to date that he is so relieved.

Summary: A series of cases, diverse in nature, were presented in which alcoholic injections into nerves were made in order to obtain relief from pain. The cases in which thoracic and cardiac pain was relieved were presented merely as a preliminary report. The alcoholic injection into nerve tissue for the relief of pain, from our experience, is to be recommended highly.

Discussion: Dr. Herman Schwatt (by invitation) said: There is nothing so troublesome as the relief of dysphagia in laryngeal tuberculosis. At the Montefiore Hospital we have a great many such cases, and for many years we have tried one method or another to relieve them. We have tried alcoholic injections a number of times, and have dropped it, and taken it up again. As a rule, we have succeeded in relieving about 30 per cent of the patients. It seems to me, since we have had occasion to observe the remarkable results of Dr. Swetlow, that it is all a matter of technique. Alcohol injection is not a new thing, but Dr. Swetlow has evolved a technique which certainly is very far superior to the one used before. I can fully substantiate his statements. The cases which he has treated have been cases of very advanced pulmonary and laryngeal tuberculosis. Some of them had eaten practically nothing for a period of days and even weeks. They had been slowly starving, and the injection of alcohol into the superior laryngeal nerve by the technique of Swetlow worked a remarkable change. Some of the patients who had not been able to swallow can take various kinds of acid, salty, solid and liquid diet. This treatment is not intended for the cure of laryngeal tuberculosis, but anyone who has seen these patients suffer from this condition should be delighted that a technique has been perfected by which they can be relieved during their last days.

Pleuritic pain is not a frequent symptom in pulmonary tuberculosis. However, there are some cases that do complain of severe pain. Just as in the laryngeal cases, the results which have been obtained are marvelous, and it is certainly a method to be recommended.

Dr. Simon Rothenberg (by invitation) said: I have been very much impressed with the splendid work of Dr. Swetlow and his fine presentation. He is to be complimented upon the accurate method and technique used. All of us come face to face with the problem of pain and all of us know how helpless we are at times. For a number of years I have used alcohol injections in certain types of cases with a fair measure of success in relieving pain. I have had no experience with laryngeal cases and none with pleuritic pains. I have used alcoholic injections in single nerve involvements, such as in cases with occipital nerve pain and unilateral headaches. In these conditions the results have been very good. I also have used alcohol injections paravertebrally in cases of herpes zoster, with fair results. The use of saline injections in this condition has at times given me equally marvelous results. Certain cases will withstand any sort of treatment. That may be due to bad technique, but it is known that we do not get as good results in some as in others. For a number of years I have used alcohol injections in pruritus ani. Within the last year I had one case at the Jewish Hospital who was treated in various ways and was operated upon twice for partial resection of rectum without relief from her symptoms. Alcohol injections around the anus and rectum gave her prompt relief and she has remained well for the past year. I have never used epidural injections of alcohol for this condition. I have also used alcohol injections in certain types of brachial neuritis, using the injection paravertebrally, and have obtained quite satisfactory results, especially during the acute attacks of pain. In sciatica I have used alcohol injections from time to time, but I cannot say that I have found it to be advantageous over the use of ordinary saline injections given epidurally. I have, therefore, abandoned the use of it in those cases. I have, however, been very much impressed with Dr. Swetlow's suggestion to use alcohol injections in angina pectoris. I have myself been working along these lines and planned to use it in the very next case I would see. It occurred to me that instead of injecting the alcohol paravertebrally in angina cases one might inject the stump of the cut sympathetic nerve and in that way get a wider effect than by merely cutting the nerve itself. I think this work is only in its very infancy, and I am sure that with such splendid work as that of Dr. Swetlow's, we shall obtain good results for otherwise intractable conditions.

Dr. W. M. Kraus said: Dr. Swetlow's work, as has been said, is very stimulating and suggests much work, not alone in the direction which he has indicated, but in other lines as well. I think that the problem of the anatomy of pain fibers in the sympathetic nervous system is as involved as any which exists. The work of Langley, in particular, on cats showed that the sympathetic motor fibers follow a very devious pathway and that a general peripheral nerve contains

fibers from a great many spinal segments. It is difficult to say whether the sympathetic sensory fibers follow such a path or go directly into the spinal cord at the same level as the nonsympathetic fibers. If we try to trace the sensory fibers inward, we are unable to say whether the sensory fibers, say off the tenth thoracic nerve end in the tenth spinal cord segment, or whether they are diffused through a number of segments. I think with that problem in mind, and with Dr. Swetlow's method, we may be able to obtain information about this matter. I can share Dr. Swetlow's optimism about his method of approach from the paravertebral point, and also a certain pessimism as to our knowledge of the anatomic course. There is another question which is not remote, that of central pain. One thinks of Head's idea in this connection. It is possible that Dr. Swetlow's method could very well be applied to cases of pain in diseases of the central nervous system. It would be interesting if Dr. Swetlow would take a case of Parkinson's disease with a severe pain in the arm, and see whether blocking the pain far from the lesion could, by cutting off afferent impulses, relieve the pain. I think it is very possible with Head's work in mind, and with the work of Dr. Swetlow that we can do a great service in many of these extremely painful and incurable neurological conditions.

Dr. S. P. Schwartz (by invitation) said: I should like to call attention to a peculiarity in cardiac arrhythmias that occurred in one of these cases following treatment. The patient presented a sinoauricular block and during the time of the block, symptoms of distress were all absent, whereas previous to treatment she complained of skipping and jumping of the heart beat when the irregularity was present. This is just an incident in the work of Dr. Swetlow, but should be considered in the light of future work in angina pectoris. Dr. Swetlow stated that before the injection of alcohol the patient was able to walk only a block and a half, and that following this injection of alcohol she was able to make ten blocks without complaining of any pain or of any symptoms. During the last few days she was beginning to become conscious again of the same type of irregularities of which she complained before the injection. It is possible that the injection of alcohol releases the patient's consciousness of pain from irregularities. Dr. Swetlow has brought out one point on which cardiologists are not as yet agreed, and that is the question of the relation of precordial pain to various areas of hyperesthesia, especially as found on the posterior part of the chest. A further search for these posteriorly will undoubtedly bring out some interesting facts of pain that might be relieved by some such methods as described.

Dr. I. Abrahamson said: I called Dr. Swetlow's attention to an excerpt in the *J. A. M. A.* in which they found a definite belt of hyperesthesia in cases of mitral stenosis, again suggesting a method of approach by means of alcoholic injections in cardiac pain of mitral origin.

Dr. Swetlow (closing): With reference to the local injection in pruritus ani, I wish to say that, in considering this case, we

decided to treat it with epidural injection of alcohol for the following reasons: In injecting alcohol locally, one often produces abscess formation and necrosis, particularly at times when the needle goes through the rectal wall. In trying to obviate this, we decided to introduce the alcohol into the epidural space. We went slowly and gradually and worked up to a 20 per cent solution. This has absolutely no ill effects. We also injected alcohol into another patient who is suffering from multiple sclerosis. There were no rectal nor vesical disturbances.

With reference to the alcoholic injections in cardiac pain and the operative interference with the sympathetic ganglion, I wish to repeat that there are at least six different operations. Every man doing this work claims some success. A worse pain is substituted for the original pain. The suggestion made by one of the speakers to remove the ganglion and then inject the alcohol into the stumps is not justified.

Dr. Kraus has suggested the use of this method in syringomyelia with pain. If the pain is a level pain due possibly to a serous meningitis about the roots, we might be able to do something in this particular case.

With reference to the case in which the electrocardiographic reports were given by Dr. Schwartz, I wish to observe that I purposely excluded the report for the following reason: It would be an unfair presentation to bring this in, because the case had just one electrocardiographic examination before I injected her. After the injection she had several. We did not know whether these irregularities occurred before. Secondly, I cannot conceive that a ganglion situated outside the pathway of pain from the heart could have any effects on the heart mechanism. Dr. Schwartz tells me that many patients may have irregularities and not be conscious of them. The signs of cardiac exhaustion are not so much pain as palpitation and dyspnea. Many patients with marked cardiac weakness have no pain, but they know of their trouble by their dyspnea and palpitation. We can use these symptoms to regulate the activities of the patients.

END-RESULTS IN NEUROSURGERY; IMPRESSIONS DURING DECADE 1913-1922

Dr. William Sharpe said that during the past two years, the writer has been reviewing the records and examining the patients operated upon by him during the decade of 1913 to January 1, 1923. The records of only 73 per cent of these cases could be completed up to date, the greatest difficulty having been encountered in locating the traumatic ward patients and the ambulance cases. His impression of the end-results from the standpoint of the ability of the patient to earn a living and to be a useful member of the community has been discouraging, and particularly is this true of those patients having had lesions of the central nervous system, such as brain tumor, brain abscess, chronic brain injuries and internal hydrocephalus; whereas more encouraging results have been obtained in the operative treat-

ment of trifacial neuralgia, lesions of the spinal cord, brachial plexus, and of the peripheral nerves; external hydrocephalus in its milder forms, chronic brain injury of supracortical hemorrhage; and then, possibly the most gratifying of all, the treatment of acute brain injuries, both in the newborn and in adults. In searching the literature for detailed reports regarding the end-results in neurosurgery, the writer was very much surprised not to find such reports upon any large series of cases, merely reports of individual cases in detail and for a period of only two or three years after operation, and then the grouping together of brain conditions under one heading and considering the operative mortality rather than the end-result from the standpoint of a normal individual; the cerebellopontine angle tumors of the auditory nerve and benign in character and the operative relief of trifacial neuralgia with an operative mortality of less than 2 per cent and a permanent relief of the pain can in no way be compared with the seriousness of cerebral gliomata, subcortical abscess formations, and the various types of hydrocephalus and chronic brain injuries from the standpoint of future normality—physically, mentally, and emotionally.

Discouraging Field. (1) Brain tumors: Eighty-one per cent have been malignant and none of these patients is alive, having been operated on more than three and a half years ago. Even if the tumor be benign, normal brain tissue has not only been irreparably impaired, but must frequently have been damaged in the removal of such a tumor, so that a normal individual cannot be considered. The operative mortality has been 19 per cent.

(2) Brain abscess (a cortical and subcortical lesion): Operative mortality has been 72 per cent. Confusion in the mortality statistics in the literature is due to subdural abscess formations of localized meningitis so frequently complicating mastoid disease being considered brain abscess, and in these latter the mortality is justly a low one—a mere dural incision suffices, whereas the seriousness of cortical and subcortical abscesses cannot be overestimated, both as to life and to future normality.

(3) Internal hydrocephalus: A complete blockage of the ventricles in the aqueduct or in the posterior foramina has not been treated successfully up to the present date, the mortality being practically 100 per cent if surgical procedures are repeated in the hope of securing adequate drainage; no satisfactory method of drainage or permanent removal of the obstructive lesion has been devised.

Encouraging Field. (1) Operative treatment of trifacial neuralgia: The mortality has been below 2 per cent, and the relief of pain is permanent.

(2) Spinal cord lesions: The diagnosis is earlier and the localization more accurate than in cerebral lesions and the percentage of malignancy has been only 41 per cent. The operative mortality has been 9 per cent. Early exploratory decompressive laminectomies advocated in selected traumatic lesions of the spinal cord unless it is definitely known that all of the spinal tracts have been irreparably

damaged and therefore a hopeless condition; the operative mortality has been 19 per cent.

(3) Lesions of the peripheral nerves: End-to-end anastomoses most satisfactory, and the earlier after injury in the absence of infection, the better the prognosis.

(4) Surgical repair of lesions of the brachial plexus, particularly the type of brachial birth palsy in children: The operated cases numbered 146, with a mortality of one. The best functional results were obtained when the anastomosis was made at three months of age, and under six months of age; the older the child after this age, the more pronounced are the muscle contractures and the brachial shortening and deformities. Not one child, however, has obtained a perfectly normal arm, as normal as the unaffected arm.

(5) Chronic peripheral facial paralysis: Anastomosis of the central end of the ipsilateral hypoglossal nerve with the distal end of the facial nerve; 32 cases were operated upon with no mortality. The end-result has been merely an improvement at most, never a complete recovery of function.

(6) Brain injuries. (A) Acute. (a) In adults. In a series of over 1,000 acute brain injuries in adults, the expectant palliative treatment aided by repeated lumbar punctures of spinal drainage in many cases and dehydration by salines have sufficed in two-thirds of the patients, and in only 30 per cent was a cranial operation of subtemporal drainage indicated—only when the intracranial pressure remained increased above twice the normal. The total mortality has been 29 per cent, and if moribund cases (11 per cent) are excluded (those dying within six hours after injury from shock, other internal injuries, and so forth), then the mortality is lowered to 18 per cent. The operative mortality was 39 per cent, naturally, the more seriously injured patients having been operated upon: first, during the stage of severe initial shock (if the patient survives, he survives in spite of the operation), and secondly, during the terminal stage of medullary edema—when all such patients die, operation or no operation, and the operation merely hastens the exitus. The autopsy findings show usually supracortical hemorrhage of varying amount in the sulci associated with cerebral edema.

(b) In the newborn: Free blood of varying amounts in the cerebral spinal fluid of the newborn occurred in 9 per cent of 500 newborn babies, routinely lumbar punctured irrespective of the type of labor, within twenty-four to forty-eight hours after birth. Clinical signs of its presence were frequently lacking, the most common being stupor, refusal to nurse, and muscular twitches of the fingers and either orbit. During the past ten years, of forty-six newborn babies examined in consultation within two weeks after birth having signs of severe intracranial hemorrhage, lumbar puncture was bloody in varying degrees in 87 per cent of these cases; spinal drainage by repeated lumbar punctures and cranial drainage by modified subtemporal decompression were used with varying results. Operative and autopsy findings disclosed supracortical hemorrhage of varying degree as the common pathology.

(B) Chronic. (a) In adults. Usual complaints were persistent headache, dizzy spells, personality changes and convulsive seizures in a small percentage of them. Only the ones having a marked increase of the intracranial pressure (over twice the normal) and not lowered by medical treatment, glandular therapy, and so forth, were eventually drained by the subtemporal route—the findings being wet edematous brains under pressure, and along the supracortical veins in the sulci was a cloudy, whitish, new tissue formation reported pathologically as being the organization-residue of unabsorbed supracortical hemorrhage. The condition of these selected patients definitely improved following a lowering of the increased intracranial pressure.

(b) In children. The type designated as cerebral spastic paralysis, usually due to a hemorrhage at the time of birth. As in chronic brain injuries in adults, only the ones having a definite increase of the intracranial pressure were operated upon, and the operative findings were practically the same as in adults—chronic cerebral edema due to a partial blockage in the absorption of the cerebral spinal fluid through the walls of the supracortical veins by the organization-residue of a former layer of supracortical hemorrhage. The operative mortality has been 10+ per cent. Improvement has resulted in over 80 per cent of the cases operated upon, but only an improvement in these chronic cases, never a cure, the ideal time for the drainage being, as in adults, at the time of the acute condition after birth, when the blood can be drained in fluid form, and thus there is no resulting condition of chronic cerebral edema.

Discussion: Dr. W. M. Kraus said: What I can say about the surgery of the nerves is almost entirely based upon experiences in the war. Dr. Sharpe's comments on brachial plexus injuries are extremely encouraging. I have unfortunately seen but two cases operated on since the war. Dr. Sharpe thinks that there is some recovery, if not a complete recovery of function. The cases which I have seen showed but a partial recovery. It would be interesting to hear from Dr. Sharpe in his ten years' summary of his work the end results he has had in causalgia. In my experience those cases are almost always refractory to any sort of treatment and the reason is very much emphasized by what Dr. Swetlow spoke of in the early part of the evening, namely, that we do not know the pathway of the sensory fibers. It would be interesting to hear if Dr. Sharpe has operated on these cases, and if so, how many have recovered and the method of operation. I agree with what Dr. Abrahamson said about the paper, that it would be impossible to discuss all of it unless we stayed many days. The war ended with a vast number of the problems of peripheral nerve surgery still unsolved. For example, nobody seemed to be entirely convinced of the exact significance of electrical reactions. Has Dr. Sharpe had this reaction done, and do the end-results of his cases show that the electrical response after operation confirmed in any way what he found at operation?

Dr. Abrahamson said: I was very much interested in what Dr. Sharpe said about the acute injuries of the cord, especially the cases with signs coming on very soon, indicative of a transverse myelitis.

I have always felt that nobody could say positively that cord was thoroughly crushed. All we know is that there are signs of an acute transverse myelitis. Muskens and others found signs of a complete transverse myelitis in extradural lesions. In some of the cases there is not even a fracture of the lamina. A bullet had passed near the cord, and a complete transverse myelitis took place. I saw a patient recently who was accidentally shot by a policeman and the bullet passed near the cord. The cord on operation looked perfectly normal, and yet the patient presented a transverse myelitis. No fragments were found that pressed on the cord. Why not give the patient a chance in view of this uncertainty? Dr. Sharpe's work so far as brain surgery in cases of traumata at birth which he has stressed so much, is well known to all. He has done this work for many years, and some of his results are very excellent. I have seen in my practice cases he has operated on with marked improvement following the operation.

Dr. E. D. Friedman said: I think Dr. Sharpe has been a bit pessimistic over the end-results in brain surgery. We shall have to admit that curative effects are noted chiefly in lesions of the motor cortex and the cerebello-pontine angle. Deep seated neoplasms, of course, offer nothing more than the possibility of decompression in order to save the vision. We have found both at Bellevue and Mt. Sinai Hospitals that our mortality rate has not been very high and the results of decompression fairly good. Some patients have lived for periods varying from three to ten years after operation, the tumor having been localized but found to be irremovable.

The prognosis in cases of brain abscess secondary to suppuration in the lung is, of course, extremely poor. Those, however, which are otitic in origin, we feel can be helped by exploration, particularly if such exploration is made through a small trephine opening in the skull. I recall one case on our service at Mt. Sinai Hospital that presented the evidences of brain abscess following an attack of otitis media. The exploration was made in the way indicated above, in order to forestall the possibility of wide infection of the subarachnoid space. The abscess was found, drained, and the patient was discharged perfectly well.

One must agree with the statement that the results of surgical interference in the case of cord tumor are very much better than in cerebral neoplasm for the reasons which Dr. Sharpe has already mentioned. One must also agree with Dr. Sharpe in the advisability of decompressive explorations in cases of serious injury to the skull, particularly in those instances which present evidences of increased intracranial tension, either by manometric studies of the spinal fluid, or by the presence of papilledema.

Dr. Sharpe (closing) said: It is very gratifying to hear Dr. Abrahamson speak as he does regarding the present attitude of neurologists concerning acute injuries of the spinal cord; in 1916, I presented a paper upon this subject, suggesting in doubtful cases, when it is not known definitely that a transverse myelitis is present, that *then* is the advisable time for an exploratory laminectomy to

be performed, because it is during the acute stage that a transverse myelitis may be merely simulated by compression of bone or hemorrhage; therefore, the ideal time for the spinal decompression is during the acute stage and not months later, when it is just months too late and any improvement can only be a slight one at most; in 1916 I was severely criticized for this apparently radical attitude, but I am still of the opinion that unless it can be demonstrated that the spinal cord is irreparably contused or severed, such as might be inferred by the fracture-dislocation of the spinal column being out of alignment to a marked degree, then the patient should be given the benefit of an early laminectomy during the acute period in the hope that the spinal cord is not irreparably damaged.

Dr. Friedman feels that I am unduly pessimistic regarding the end-results in neurosurgery: naturally I am not speaking of the operative results from the standpoint of the operative mortality, which is justly a low one, not over 16 per cent, and especially with the improved technique and the use of local anesthesia; but I am speaking of the end-results from the standpoint of a normal individual—one able to earn his living and be a useful member of society; it is from this standpoint that the end-results of conditions of brain tumor, true brain abscess, internal hydrocephalus and chronic cerebral lesions are uniformly bad and unfortunately the literature upon the end-results in neurosurgery in detail is practically *nil*.

The end-results of severance of the posterior spinal roots for the alleviation of pain and the resection of portions of the sympathetic system for the lessening of spasticity have been most discouraging, and it is only in selected cases where the above procedures can even be considered; none of my patients upon whom I resected the cervical sympathetic ganglionic chain have been improved objectively, although one patient did state that the arm could be moved with greater facility and with less tension than before the operation.

CURRENT LITERATURE

I. VEGETATIVE NEUROLOGY.

1. VEGETATIVE NERVOUS SYSTEM.

Boas, I. PSYCHOGENIC DYSPEPSIA. [Deut. med. Woch., Oct. 20, 1922. XLVIII, No. 42.]

Gastrointestinal experts are more and more recognizing psychogenic factors in the production of a great variety of the disorders they deal with. Boas here emphasizes the importance of recognizing this fact for various types of dyspepsia. The history of the patient shows that there is usually a feeling of pressure, without strict relation to the meals. Though the patients speak of "pains," inquiry shows that it is a feeling of oppression rather than of pain. Globus is not infrequent, anorexia and nausea common. Restriction on modifications in diet are nonsense, if not harmful, and intelligent psychotherapy essential.

Vietor, Agnes C. FUNDAMENTAL CAUSE OF SPLANCHNOPTOSIS. [Bull. Lying-In Hospital of City of New York, Jan., 1923.]

The chief reason for abdominal incompetence is a developmental factor. Failures in the normal development of abdominal competence and visceral retention are correlated with the development of certain departures from the normal body form—the most constant of these departures being the retracted lower thorax. Variations in these developmental processes ("normal," or retarded, or uncompleted, or reversible) may be observed in continual operation in all human beings, and the pictorial and plastic history of the race shows them to have been occurring ever since such history began. Seeking to average the many individual variations so as to find an anatomic mean which shall serve as a workable basis for the introduction and interpretation of experiments which demonstrate anatomically the above conclusions drawn from clinical observations, the writer in this instalment presents a study of certain details of the later prenatal evolution of the liver and the sigmoid colon, with special reference to the status at term. Summarizing these, she says, individual variations in the location of the lower borders of the liver are found at all ages from at least the fourth month onward. The locations found predominating at term are also found in early fetal ages, and locations found predominating in early fetal ages are also found persisting at term. The sigmoid colon is not the anarchic member of the body which it has been considered. It develops in three definite types according as its length permits the formation of one, two

or three inverted U loops; its varied locations may be classified along four definite lines, and they are the result of migrations and displacements of these loops along well marked paths; by the study of the laws shown at work all individual displacements of these loops may be retraced, the original type disclosed and the case so classified; the loops have no secondary fixed bases; as a result of this latter condition and of its constant parietal attachment in the left pelvic or suprapelvic abdomen, the sigmoid colon can always be reached surgically in the left lower quadrant, no matter what its location or type; distention of the sigmoid colon seems to be a normal phenomenon at term, it may lead to dilatation, or it may lead to damming back of its contents into other portions of the intestine, with distention or dilatation of these latter portions. Anatomic bases for the development of mechanical obstruction and stasis, as well as methods of compensation for these processes, are demonstrated; also initial anatomic paths leading toward the development of torsion of loops. An experimental explanation of the possible formation of colon sacculations is also demonstrated.

Proust, R. ULCER OF THE STOMACH TREATED BY DIVISION OF THE SYMPATHETIC NERVES. [Bull. et. Mem. Soc. Chir. de Paris, July 18, 1922.]

R. Proust reports three cases of ulcer of the lesser curvature of the stomach treated by division of the main branches of the vegetative nerves. In two cases there was immediate relief of the pain, whilst in the third case the pain disappeared more slowly. In dividing the nerve fibers it may be found advisable to divide the coronary artery. Parman and Dorells have described a plexus of gastric nerve fibers sharply defined; this enables the nerves to be isolated and divided in a set operation. The author prefers a limited division of the nerve fibers rather than a massive resection of the vessels and nerves surrounding them. In the three recorded cases a gastroenterostomy was also carried out; this may account for the good results, as it is difficult to differentiate the effect of the two procedures. In those cases resection of the ulcer was not possible, and the section of the nerves to the stomach led to great improvement in the patients' condition. It should be possible in the future to carry out the operation by dividing the nerves and leaving, so far as possible, the vessels with their surrounding and internal neuroplexuses intact.

Ranzel, Felix. CAUSE OF HYPEREMESIS GRAVIDARUM. [Zentralblatt für Gynäkologie, June 10, 1922.]

This study combats the idea that hyperemesis gravidarum may be an expression of aversion and disgust and the reaction of the unwillingness of the woman to becoming pregnant. He substantiates his claim by the immediate cessation of the vomiting after indifferent remedies like the insertion of a pessary. This he maintains gainsays

the psychogenic theory. Besides, necropsies occasionally show anatomical changes in the liver similar to phosphorus and fungus poisonings, in which cases toxic effects must be assumed as etiological factors. [The author has entirely misrepresented the "theory" and attacks wind mills of his own construction.]

De Rudder, B. PARALYTIC ILEUS AFTER DIPHTHERIA. [Klin. Woch., Jan. 1, 1923, II, No. 1.]

A clinical report of a paralytic type of ileus in a child three months of age occurring two weeks after a mild nasal diphtheria.

Deusch, G. THYROGENOUS CONSTIPATION. [Münch. med. Woch., Jan. 26, 1923.]

A clinical report upon the benefits derived from thyroid therapy in severe constipations. An incomplete analysis involving only one factor.

Rosenburg, J. JAUNDICE FROM FRIGHT. [Arch. Lat. Am. d. Ped., Jan., 1923, XVII, No. 1.]

This is a clinical report of a near accident in which a girl aged nine barely escaped being run over. The following day she developed an intense jaundice, and slight fever, with clay-colored stools, while the urine was dark. The liver and spleen were enlarged. After eleven days, with the exception of a still perceptible jaundice, the girl was well. He collects twelve similar records, this one being the first in South America to be reported.

Wilson, T. S. PHYSIOLOGIC EXPLANATION OF PAIN DUE TO FUNCTIONAL DISTURBANCE OF MUSCLE OF COLON. [British Medical Journal, June 17, 1922, No. 3207, p. 944. J. A. M. A.]

Clinical study of cases has convinced Wilson that pain can be caused by the transference to the sensory tracts of the cord of afferent impulses which arise in the sympathetic and which if retained in that system would cause disturbance of the brain of a reflex character and would not cause physical pain. It seems probable that when the muscular activity which originates the nervous impulse is decidedly more powerful than impulses due to normal digestive activity, there is considerable probability of this transference taking place, and when, as in cases approaching the severity of ordinary colic, the afferent impulse is an extremely powerful one, the transference of the nervous impulse from the sympathetic system to the sensory tracts of the cord almost invariably takes place and a sensation of pain is the result. With regard to the localization of the pain it is not, as a rule, felt over the spot where it probably arose, but is usually "referred" or "segmental" in character. The clinical study of a series of cases in which mental depression and neurasthenic symptoms result from functional disturbance of the colon muscles, shows that there are some cases which cannot be explained

by the theory of inhibited cerebral vasodilatation. When the circulation alone is concerned, the defect can be removed by a more vigorous mental effort, just as is the case with physical lassitude which can be overcome by a more vigorous muscular effort. It is not at all unusual, however, to find cases of functional colon disturbance in which the mental depression is so severe as to be wholly beyond the patient's voluntary control, and constitutes an acute mental misery which is comparable in the mental sphere to a severe physical pain in the sphere of sensation. The occurrence of such cases compels recognition of the fact that nervous impulses arising in the colon and passing to the brain along sympathetic nerve paths have the power of directly disturbing that portion (or those functions) of the brain on which the sense of well being is dependent, and of giving rise to an acute mental misery which truly represents the physical pain which they would have felt if the afferent impulse causing it had been transferred from the sympathetic to the sensory tracts of the cord. The fact that these cases are really due to the functional disturbance in the colon is demonstrable clinically by the fact that they yield to treatment which lessens the amount of postural activity in the colon.

Held, I. W., and Roemer, J. GASTROSPASM A CLINICAL AND ROENTGENOLOGICAL STUDY. [Am. Jl. of the Medical Sciences, Vol. CLXIV, No. 2, p. 188.]

Gastrosplasm is not new, it has long been known to physiologists and anatomists. Its diagnostic possibility and clinical importance is the outcome of the X-ray era. Gastrosplasm was aptly divided by Holzknicht and Luger into regional, circumscribed and total. Regional gastrosplasm may occur in any part of the stomach; the most common locations are at the cardia and pylorus.

Cardiosplasm—Although cardiosplasm primarily belongs to the cardiac end of the esophagus, its relation to gastric diseases and its symptomatology are so purely gastric that brief mention of it must be made here. We understand by cardiosplasm a spastic contraction of the cardiac end of the esophagus of shorter or longer duration, sometimes lasting for weeks and even months and leading to dilatation above the contraction. From an etiologic standpoint cardiosplasm is in the great majority of cases purely functional. This is easily understood when we recall that the propulsion of food from the esophagus into the stomach is mostly controlled by the automatic nervous system. We should therefore look for such clinical manifestations, which indicate instability of the vegetative nervous system. The vagotonic complex (Epinger and Hess), such as dilatation of the pupils, slow pulse, slowing of the pulse when pressing on the eyeballs (Aschner's phenomenon), slowing of pulse in bending forward, dry skin and pallor and spastic constipation. It is surely of clinical importance to recognize the fact that an organic disease like gallstone or renal colic, when associated with cardiosplasm,

that vagotonia plays quite a role as a predisposing associated causative factor.

X-ray diagnosis of cardiospasm. The most conclusive diagnostic method is the X-ray; we therefore omit all the other methods. A most important radiosopic and radiographic sign is the visualized active peristalsis above the seat of the spasm. This is more marked in early and transient cases than in the advanced cases where dilatation above the obstruction is very pronounced. The reason for that lies in the fact that the more the obstruction is due to spasm, the more the entire esophagus is in a state of hypertonus and the esophagus with its strong musculature tries to overcome the obstruction. In cases of obstruction at the cardia, the result of idiopathic dilatation, where atony of the esophagus musculature is a primary factor, there is no peristalsis. Peristalsis of the esophagus is likewise absent in most of the cases of carcinoma at the cardia because of the associated loss of tone of the esophagus musculature. We differentiate two kinds of spasms, incomplete and complete. The former manifests itself fluoroscopically and radiographically as follows: The contrast substance is seen to hold at the point of obstruction and the esophagus above it fills in an irregularly spindle-shaped form, exceeding its normal width two or three fold. For a few minutes nothing may be seen to pass through the obstruction. Repeated empty swallowing often overcomes the spasm. In the latter the esophagus is immensely dilated, sausage shaped, smooth in outline with an abrupt termination at the cardia. The dilatation may become so marked that the esophagus may hold a pint or more of food.

Pylorospasm—Approaching the stomach proper, the most frequent seat of regional spasm is that of the pylorus, so-called pylorospasm. Pylorospasm is a condition where a part or the entire pylorus is in a spastic state for a shorter or longer duration. When a spasm persists for a long time, it may even lead to hypertrophy and marked thickening of the pylorus, with a resulting palpable mass simulating a tumor.

Etiology. From the etiological standpoint, pylorospasm may be of intra- and extragastric origin. (Intrinsic and extrinsic—Carmen.) The intragastric cause is by far the less frequent, and if present is mostly the outcome of a prepyloric ulcer, less frequently due to ulcer on the lesser curvature and still less frequently in duodenal ulcer. We have seen it occur in gastro-enterostomized patients. Like Carmen and Miller we saw it occasionally in carcinoma of the stomach.

The extra gastric causes for spasm are numerous. According to our experience gall-bladder disease stands out most prominently. Holz knecht and Luger were the first to call the attention to the frequency of pylorospasm in gall-bladder disease, and they pointed out that the existence of a solitary stone in the gall bladder is more prone to give rise to such a spasm than multiple stones. Their observations were since then confirmed by Carmen, Case and others. Our experience (as demon-

strated by accompanying figure) fully confirms their views. Other causes are: Chronic pancreatitis, chronic appendicitis, renal calculi, chronic lead poisoning, morphine poisoning, tabes dorsalis, also chronic interstitial nephritis, particularly during the stages of suburemia and uremia.

In the pre-X-ray era, experts on palpation claimed to have succeeded in palpating a spastic pylorus. Experts however are the exception. The X-ray, on the other hand, makes us visualize spasm with ease and offers an explanation for the symptoms. The X-ray findings are as follows: Fluoroscopically, the food is seen to stop at the antrum and sometimes even for several minutes, no food at all is seen to pass and what enters the pylorus, is either narrow or pivot-shaped. Palpation does not change the contour of the pylorus. The X-ray plate (see figure) likewise shows the above described phenomenon. The stomach proximal to the contracted pylorus shows dilatation and active peristalsis. It was already stated above that the clinical and X-ray manifestations are such that the differentiation from carcinoma becomes very difficult. We may state, that we, like others, had cases of persistent pylorospasm with anacidity, which we submitted to operation with a doubtful diagnosis, but inclined to carcinoma. In two cases the pylorus was so hard and thick that the surgeon had to open the pylorus to convince himself that there was no tumor within. In cases where the hypertrophied pylorus gives rise to a palpable mass, and the contrast meal fails to fill the pylorus, the differential diagnosis between spasm and cancer is almost impossible.

Regional spasm may occur also in the fornix or tube of the stomach. In these cases it is brought about by pressure from without. We observed a patient in whom a large spleen made the upper part of the stomach from air bag to mid part of the tube, appear like a narrow rigid canal with no persistalsis and a very small and deformed air bag. The palpable mass of the left side, which was the enlarged spleen, awakened the suspicion that the tumor might have been due to a malignant disease of the stomach. Inflation of the colon with air made the outline of the spleen to the palpating hand more definite. A more extensive spasm of the stomach, taking in the tube and pylorus and making the cardiac end appear funnel shaped, was seen by us in a woman with a large fibroid tumor of the uterus.

Regional spasm of the tube or pars media with dilatation of the cardiac end and the pylorus is sometimes met with. It is usually of extragastric origin and only the clinical history can establish the cause.

A seat of regional spasm is often at the point in the stomach just below the incisura cardiaca. We do not refer to the standing contraction or the incisura on the greater curvature. This is to be discussed below. What we have reference to here is (as shown on the accompanying figure), that the contrast substance is held at the point mentioned above. The fornix is seen dilated and sometimes from five to ten

minutes either no food is seen to come down or only a thin streak along the lesser curvature. In the former place the fornix presents a pear-shaped or triangular appearance (see figure) ; in the latter case, the narrowing below the dilatation bears resemblance to a cardio-spasm with the dilated esophagus above it. We have therefore conceived the idea that the spasm is not only local, but that it spreads to the greater part of the tube.

Another point of very frequent regional spasm is that of the sphincter pylori. This condition is often brought about reflexly by chronic appendicitis, colico mucosa, and is also often functional. It has great significance in erosions and ulcer in the region of the sphincter pylori. Such erosions may give rise to periodic gastralgia terminating in vomiting large quantities of fluid, but rarely solid food. Vomiting gives great relief. Morphine, on the other hand, may make the condition worse. If the condition lasts a long time, dilatation and hypertrophy of the pylorus becomes so marked as to give rise to a palpable tumor.

The fluoroscopic and radiographic appearance in such cases is most striking (as shown on the accompanying figure). The pylorus appears as if suddenly cut off and is immensely dilated. Forcing the food out, while fluoroscoping, we see only a narrow stream of contrast substance, which fills the first portion of the duodenum very thinly, giving it the appearance of a goose feather. Sometimes we may watch for several minutes without seeing any food going through the pylorus. If we fluoroscope and take plates of such cases, an hour or two after the ingestion of the contrast meal, very little is seen to have left the stomach. If the spasm is of extra gastric origin it is usually very transient and there is only a very moderate delay in the emptying of the stomach and as a rule no six-hour residue is present. If there is a large six-hour residue in such cases, we usually find the rest of the contrast substance in the terminal ileum, which becomes considerably dilated. The cecum, as a rule, contains very little or no contrast substance at all. This seems to us to indicate the existence of a spasm in the sphincter of the ileo-cecal valve and that is most likely the primary cause of the spasm in the sphincter pylori. The delay in the emptying of the stomach may not depend entirely on the persistence spasm in the sphincter pylori, but also, to a great extent, upon the fact that the small intestines are filled and therefore the so-called intestinal hunger (Pawlow) is not present.

When the spasm of the sphincter pylori is due to a local erosion, the six-hour residue is large. The terminal ileum containing little contrast substance or, maybe, entirely empty and the distribution through the colon may not be normal. The reason that the small intestine contains so little contrast substance, although the stomach contains much is explained by the fact that the food is so thoroughly predigested in the stomach, that it therefore runs through the small intestines rapidly.

Incisura—The incisura or spastic hour glass has been made accessible of recognition by means of the X-ray. It appears mostly on the greater curvature, a little below the incisura cardiaca. It may, however, appear in any other part of the greater curvature of the stomach. It may be transient or persistent. There is usually one incisura, but two or three may be present. The depth and width of the incisuræ vary from that of a small nick to a deep wide contraction reaching the lesser curvature and giving the stomach a bilocular appearance. When there are two or three incisuræ the stomach appears as if it were divided into several compartments. These incisura may be of extra- or intragastric origin. Such incisuræ are met with occasionally in cases of chronic appendicitis and gallstones. Very rarely they appear spontaneously in such cases during fluoroscopic examination, but more commonly, as pointed out by both Case and Carmen in this country, and Borsany and Hurst abroad, the incisura is brought about when pressure is exerted over the diseased organ (appendix, gall bladder and duodenum) while fluoroscoping. Even under such circumstances it is not a common occurrence. It has been our experience that when pressure on a diseased appendix or gall bladder brings about such indentation, it is very transient and lasts only as long as the pressure is continued. More commonly, it is seen in neuropathic individuals, especially where vagotonia (tropia) is predominating. Also, pressure from without as a tumor in the left hypochondrium, large spleen or even gas in the splenic flexure, may produce such spasm. The most important intragastric cause for spasm is an ulcer on the lesser curvature of the stomach, just opposite the incisura. The spastic incisura, whether of extra- or intragastric origin, may be transient and disappear spontaneously, while fluoroscoping, or may persist during one examination and not be present at the next examination. Deep and wide incisuræ, situated opposite an indurated or penetrated ulcer on the lesser curvature, are usually persistent and only disappear under deep narcosis. That is why the surgeon in the early days of X-ray diagnosis contradicted the X-ray finding of hour glass. The differential diagnosis between spastic incisuræ of extragastric origin and that due to ulcer on the lesser curvature of the stomach is made by the administration of antispasmodics, like atropin or tincture belladonna, according to the method of Carmen or Papaverfin or Atropapaverin, as advocated by Holzknecht and Gultzer. The disappearance of the incisuræ, after antispasmodics, according to our opinion, does not exclude an ulcer on the lesser curvature. The persistence of the incisuræ, on the other hand, and especially if a niche is seen on the lesser curvature, establishes the diagnosis of ulcer with absolute certainty.

A rare type of incisura occurs on the lesser curvature just below the air bag, indicating the seat of an ulcer. Another rare form of spastic incisura is mentioned by Faulhaber. In this type the cardia

is to the left and is connected by a narrow isthmus to the rest of the stomach, which lies to the right. Another rare intragastric cause for incisura is carcinoma of the stomach.

Total Gastrosperm.—Total gastrosperm is the rarest of all forms of spasms and is in the most cases of extragastric origin. Cases reported in the literature were due to chronic lead poisoning, tabes dorsalis and morphinism. Two cases were seen by us, one due to chronic appendicitis and the other tubercular peritonitis. Another case mentioned in the literature was due to gallstone disease. Carmen and Miller reported a case of gastrosperm, produced by a small cancer on the lesser curvature of the stomach. Gastrosperm is characterized by an extreme hypertonus. The stomach is considerably diminished in size. It is situated very high in the abdomen, most of it to the left of the median line and often running transversely so that the pylorus and part of the corpus are to the right of the median line. The air bag is small, peristalsis is almost absent and the food is seen to pass continuously into the small intestine. It resembles almost entirely a scirrhou cancer. The resemblance of all forms of gastrosperm to filling defect due to cancer is so striking that, rightfully, do Carmen and Miller make the statement that not only is the novice in danger of mistaking it for cancer, but the expert as well. [Author's abstract.]

2. ENDOCRINOPATHIES: PARATHYROID, SUPRARENAL.

Peiper, H. ADDISON'S DISEASE. [Zeits. f. Urol., 1923, XVII, No. 1.]

Peiper recommends roentgen-ray examination of the kidney region after insufflation of oxygen into the bed of the kidney. He advocates removal when the suprarenal capsule is the seat of a unilateral tuberculous process.

Lawrence, C. H. ADRENAL THERAPY. [Boston Medical and Surgical Journal, Vol. CLXXXVII, No. 5, Aug. 3, 1922.]

This paper forms part of a symposium on glandular therapy. The author points out that while certain effects of adrenalin (as in the relief of asthma) are definitely established, there is no clear understanding of its use in substitutive treatment of hypoadrenalism. This is because the clinical symptoms of adrenal insufficiency in human beings are not well understood, and because until recently adrenalin has been thought to be the only active principle of the gland. Therefore the clinician and the laboratory worker have been unable to agree upon the effects which could be produced by adrenalin. Recent work, however, indicates that the cortex is the more important part of the adrenals, and may thus explain results obtained by administering adrenal substance by mouth. The writer emphasizes the fact that increase in the knowledge of adrenal therapy is hampered by its hyperenthusiastic use in cases of obscure symptoms

accompanied by low blood pressure. If there is to be progress, it must come through painstaking study, checked by research. There should be less use of glandular extracts in cases simply because the picture is obscure and the action of the endocrines is likewise obscure. [Author's abstract.]

Gruber, C. M. STUDIES IN FATIGUE, XII. [Am. Jl. of Phys., November, 1922, LXII, No. 3; J. A. M. A.]

Gruber found that suprarenal secretion evoked by splanchnic stimulation increases the height of muscular contraction of both nonfatigued and fatigued skeletal muscle. The quantity of epinephrin secreted must be fairly large judging from the height of betterment and the duration of improvement when compared with the results from injections of epinephrin intravenously. Inasmuch as epinephrin secreted by splanchnic stimulation affects nonfatigued and fatigued skeletal muscles alike, it cannot be regarded a specific antagonist to the so-called fatigue substances. It increases the height of contraction and irritability of both muscles. Its exact mode of action has not been determined.

Martin, E. G., and Armistead, R. B. INFLUENCE OF EPINEPHRIN ON METABOLISM. [Am. Jl. of Phys., November, 1922, LXII, No. 3.]

This experimental study tends to show that the thermogenic influence of adrenalin is not specific for any one kind of tissue.

Brutschy, P. LIPOID HYPERPLASIA OF SUPRARENAL GLANDS WITH CALCIUM DEPOSITS IN HYPOSPADIASIS PENIS SCROTALIS AND BILATERAL CRYPTOCHISM WITH FALSE ACCESSORY SUPRARENAL GLAND ON THE RIGHT TESTICLE (Pseudohermaphroditism Masculinus Externus). [Frankf. Zschr. f. Path., 1920, Vol. XXIV, No. 2.]

Brutschy reports in detail a most unusual case of pseudohermaphroditism unique as a case of masculine formation whereas former described cases of general hyperplasia of both suprarenals were of feminine pseudohermaphrodites. This case was that of a child of related parents of late birth who died seventeen days after birth with severe intoxication with nervous and gastric symptoms. The findings at autopsy led the writer to believe that there had been interference in development somewhere about the ninth week of embryonic life. The marked malformation of the suprarenal glands seems to be due to an independent disturbance of development, the time of which could not be determined. Brutschy gives in full the anatomical report as follows: A slight hydrocephalus, fissured uvula, rather large thymus, two accessory spleens each the size of a pea, inflammation of the umbilical artery. The external genitals seemed those of the female with a clitoris-like formation in the normal location, the sexual folds and prominences representing the labia minora and majora. The vagina was simulated by a widely ramifying urogenital sinus in the

floor of which the urethra and both vasa deferentia opened. Uterus, tubes, and ovaries could not be demonstrated. But somewhat small, yet microscopically typically formed testicles were found on both sides near the inguinal canal. The prostate and Cowper's glands were present but not the seminal vesicles. There was an accessory suprarenal upon the right testicle between the corpus Highmori and the derivative spermatic ducts consisting only of cortical substance (diminutive interrenal body) and besides a highly developed paradidymis. Both suprarenals were large (3.8: 2.2: 1.0 cm.), yellow, nodulated. Outgrowths of the suprarenal cortex were to be found upon the right renal capsule and renal surface. The microscope showed complete absence of the medullary substance of the suprarenal glands; the cortex consisted of lobules the cells of which showed a high degree of lipoid degeneration in part with deposit of double refractive crystals. Isolated foci with cholesterol crystals, giant cells of foreign bodies, and calcium concretions were found in the intervening tissue. [J.]

Guglielmetti, J. ACTION OF EPINEPHRIN. [Rev. d. l. Asoc. Méd., July-August, 1922, XXXV, Nos. 213, 214.]

An experimental study tending to point out that epinephrin acts on the intermediate substance which is found at the point of junction of the muscle and the nerve in striped muscle.

Sézary, A. DIAGNOSIS OF ADDISON'S DISEASE. [Bull. d. l. Soc. Méd. d. Hôp., Dec. 1, 1922, XLVI, No. 34.]

Asthenia, arterial hypotension, pigmentation of skin and mucous membranes and Sergent's white line, are not always diagnostic of Addison's disease. Asthenia, if evidenced by a rapidly increasing fatigue of muscles during work, is the most important finding. This is present in myasthenia gravis and in many other conditions.

Oddo, C., and Oddo, J. ADDISON'S DISEASE AND PIGMENTARY CIRRHOSIS. [Bull. d. l. Soc. Méd. d. Hôp., Dec. 1, 1922, XLVI, No. 34.]

A pathological report of two cases of pigmentary cirrhosis in combination with Addison's disease. One patient had diabetes, the other was free from it.

Edmunds, C. W. IMPORTANCE OF THE ADRENAL GLANDS IN THE ACTION OF PILOCARPINE, PHYSOSTIGMINE, AND STRYCHNINE. [Am. J. Physiol., 1922.]

In the intact animal when the movements of the uterus are being registered the administration of pilocarpin is frequently followed by relaxation of the organ. When, however, the organ is isolated in a perfusion bath, pilocarpin always causes a contraction. These contradictory results from the use of pilocarpin are explained by the fact that

the alkaloid stimulates the adrenal glands and the relaxation of the uterus which is seen in intact animals is not due directly to pilocarpin but is due to epinephrin which is in increased amounts in the blood through the stimulating effect of the pilocarpin. If the adrenal glands are removed before the pilocarpin is administered, relaxation of the uterus does not follow but contraction. A similar relation was found to exist for physostigmin, which also stimulates the adrenal glands. Somewhat similar effects are described for strychnin, which in turn also increases the amount of epinephrin in the blood. It is suggested that the relation of these alkaloids to the adrenal glands may be of considerable clinical importance. Physostigmin, for instance, is frequently given in case of intestinal atony, frequently with disappointing results, in that the atony is not removed. It is not unlikely that this is due to the effect of the physostigmin, which, in addition to acting on the intestine, also increases the amount of epinephrin, and thus favors the continuation of the condition of atony. [Author's abstract.]

Alvarez, W. SUPRARENAL INSUFFICIENCY. [Sem. Méd., Oct. 26, 1922, II, No. 43; J. A. M. A.]

Washington Alvarez relates that two girls, ten and twelve years old, presented intense pure suprarenal insufficiency. One was convalescing from typhoid, and the agonizing pains suggested perforation of a viscus. Under four drops of epinephrin solution, three times a day for six days, all the symptoms promptly subsided. In the other case, the child had both malaria and typhoid, but she recovered under epinephrin kept up for nine days. A third patient was a man of fifty with chronic malaria and signs of suprarenal insufficiency. He improved under epinephrin and quinin, but the periods of weakness, hypertension and other signs of suprarenal deficit have returned at times during the year since. The necropsy findings are described further in an infant, aged six months, who had succumbed to acute chloroform intoxication. Both suprarenals showed extensive hemorrhages.

Maragliano, D. IMPLANTATION OF NERVES IN SUPRARENAL CAPSULES. [Ref. Med., Nov. 27, 1922, XXXVIII, No. 48.]

Experimental implantation of suprarenal tissue has hitherto been unsuccessful, so far as functioning survival is concerned. The author therefore tried to prevent the usual absorption by implantation of splanchnic or spinal nerves into the transplanted tissues. However, the nerves did not proliferate, if he left the capsules in place, nor if he transplanted them with the nerve. The absorption was not prevented.

II. SENSORI-MOTOR NEUROLOGY.

1. CRANIAL NERVES.

Koller, C. THE MODE OF ACTION OF MYDRIATICS AND MIOTICS. [Arch. Ophth., November, 1921.]

Although for the quick reactions to light and accommodation the sphincter plays the most important part, the habitual width of the pupil, the state of fullness of the vessels of the iris, is the determining factor. Inflammation or congestion of the iris makes the pupil small. At death the pupil becomes wide, especially if an animal is bled to death. If methylene blue be injected into the aorta of an exsanguined rabbit, as the ears become blue it is found that the pupils contract. Atropin, as well as paralyzing the sphincter, has a constricting action on the vessels, as shown by its bleaching effect on the pericorneal injection. Cocain, too, has a vessel-constricting effect, well demonstrated by injecting it subconjunctivally. The vasoconstriction of cocain is seen, too, in the widening of the palpebral fissure. Adrenalin dilates the pupil by vasoconstriction alone, shown by injecting it. Miotics, besides stimulating the sphincter, are vasodilators; one can directly observe this with a lens or corneal microscope. Dionin contracts the pupil by congesting the iris. In glaucoma the large pupil indicates constriction of arteries and the ciliary veins are engorged. This means that the circulation is sluggish and the increased amount of exuded fluid cannot be disposed of by the usual channels. According to the Leber-Knies theory, the iridic angle is the only exit for intraocular fluid, but it is certainly not the only way. In the healthy eye the anterior surface of the iris acts as a sponge, taking up the contents of the anterior chamber. Hence absorption from the iris surface is hastened by miotics and delayed by mydriatics.

Terrien, F. OCULAR DISTURBANCES IN RESPIRATORY DISEASE. [Paris med., Jan. 27, 1923.]

Ocular disturbances in affections of the respiratory system may be of three kinds—reflex, infective, or mechanical. In the last case venous stasis due to obstruction in the lesser circulation gave rise to hemorrhage. (1) Reflex ocular disturbance. Inspiration is accompanied or followed by a slight degree of dilatation of the pupil even in the normal state, whereas expiration gives rise to a slight contraction of the pupil. In dyspnea the pupil is dilated, as the inadequate supply of oxygen in the blood irritates the center for the pupil in the medulla. In Cheyne-Stokes breathing the pupils are contracted during the period of apnea and do not react to light, but become dilated again on return of respiratory movements, and the reaction to light reappears. (2) Mechanical ocular disturbance. Hemorrhages in the conjunctiva or even in the retina may occur after violent attacks of coughing or in a child during spasms of pertussis. Terrien has seen a case of paralysis of the external rectus

and of the facial nerve complicated by hemianopsia in the child, probably as the result of pontine hemorrhage. Similar cases have occurred in glass-blowers, especially in elderly persons and in tabetic subjects. All these manifestations are the result of venous stasis. They are most pronounced in cases of hanging, in which hemorrhages are found in different parts of the eyeball, such as the conjunctiva, eyelids, retina, and canal of Schlemm. (3) Infective disturbances. Pulmonary infections, especially pneumonia, are often complicated by herpes of the cornea or dendritic keratitis. The affection is chiefly found in the adult, especially in men, often at the same time as herpes on the nostrils or lips and pain in the back, the latter suggesting a meningeal reaction. Changes in the pupil in pneumonia or chronic apical disease, consisting in dilatation on the affected side followed by contraction, are the result of irritation and later paralysis of the sympathetic. Paralysis of the extrinsic and intrinsic muscles of the eye may occur during pneumonia or a few weeks later, as in diphtheria. Blood infection fairly often gives rise to a metastatic ophthalmia, and more rarely to a neuroretinitis. The iridochoroiditis frequently ends in panophthalmia, and when this is bilateral the prognosis is usually fatal. Profuse hemoptysis, like all other hemorrhages, may be complicated by amaurosis, but this is relatively rare. In a lesser degree, the author suggests, the eye reacts upon the lung. Vigorous pressure on the upper lid retards expiration, and the same is true of irritation of the conjunctiva or cornea. Malignant tumors of the eyeball have sometimes given rise to metastases in the lung. Thus in forty-six cases of sarcoma of the uveal tract complicated by metastases the lung was involved three times and the epiglottis once.

Ferguson, W. J. W. CEREbroSPINAL FLUID IN DISEASE OF FUNDUS. [Brit. Med. J., Dec. 30, 1922, II, No. 3235.]

In young adults suffering from diplopia, optic atrophy, or retrobulbar neuritis the early investigation of the c.s.f. is necessary. The colloidal gold reaction is of undoubted value not only as throwing light on a possible syphilis but because of its very clear findings in certain types of multiple sclerosis.

Sluder, G. "LOWER HALF HEADACHE" OF NASAL ORIGIN. [J. A. M. A., Dec. 2, 1922.]

"Lower half headache" which seemed to be related to the nasal (sphenopalatine or Meckel's) ganglion was described by this author in 1908. In those cases there was almost always a recognizable lesion in the district in which the ganglion lay, and the symptoms could be relieved by cocaineization of the ganglion. Later Sluder found that typical lower half headache could be present without such a lesion and could not be relieved by such treatment. There were cases of sphenoiditis, hyperplastic or suppurative, and he believed that the headache was produced by irritation or

inflammation of the nerves which supply the ganglion. Such lesions, of course, are situated centrad to the ganglion and naturally are not influenced by cocainization of it. Treatment of the sphenoid is successful for these lesions. The clinical picture of lower half headache is discussed fully.

De Saint-Martin. OCULAR SYNDROME OF BOTULISM. [Med., January, 1923, IV, No. 4.]

The usual ocular signs of botulism, more or less complete external and internal ophthalmoplegia, should at once lead to the diagnosis, especially when connected with other ocular signs. He found in eight cases retinal congestion, amblyopia, and a very narrow field of vision.

Young, Gavin. RELATION OF THE OPTIC AND VIDIAN NERVES TO THE SPHENOIDAL SINUS. [Journal of Laryngology, December, 1923.]

Thirty cases were examined in the post-mortem department of the Western Infirmary, Glasgow, the cases not being specially chosen, being the ordinary subjects for examination. A block of bone was removed from the foramen magnum to the crista galli of the ethmoid, the skullcap and brain having previously been removed. In the thin-walled type of skull the sphenoidal sinus lies posteriorly to the ethmoidal labyrinthine; in the sclerotic type it lies mesially to it, and there are many grades between these two, according to the amount of bone absorption that has taken place to form the sinus. The majority tend to be of the thin-walled type. The optic nerve lies laterally to the ethmoidal and sphenoidal cells, at the back part of the orbit, being in actual bony contiguity only where it leaves the orbit posteriorly. In 90 per cent of the cases the bone between the nerve and the sphenoidal sinus was so thin, in at least part of its course as to be transparent, and in 13 per cent there was actually one or more hiatuses in the bone. In one specimen there was more hiatus than bone in the separating layer. In many cases the sinuses were of unequal size. In 46 per cent this was so marked that the sphenoidal sinus of one side was in relation to the heterolateral cavernous sinus, passing behind its neighbor, while in 30 per cent one sphenoidal sinus was in relation to the heterolateral optic nerve. In 23 per cent of cases the walls of the optic nerve canal bulged into the sinus, in one or two cases making almost a complete bony tunnel. Numerous blood vessels were noted connecting the orbit and the sphenoidal sinus. Attention is drawn to the condition of optic neuritis due to infection from diseased posterior nasal sinuses, and the dangers of too radical interference with the sphenoidal sinus are suggested.

It is pointed out that the Vidian nerve runs forward under the floor of the sphenoidal sinus to supply the sphenopalatine ganglion. In 50 per cent of cases the bone separating the nerve from the sinuses was transparent; in 10 per cent there was a hiatus. In one case the nerve was

covered only by the sinus mucosa. It is suggested, following on the work of Syme and others, that neuritis of this nerve may cause pain in the ear, and it is further pointed out that a similar condition may be the origin of certain cases presenting the Meniere syndrome, the etiology of which is not yet fully understood. [Author's abstract.]

2. PERIPHERAL NERVES.

Soca, F. FATAL EMETIN POLYNEURITIS. [Bull. Soc. Méd. Hôp., Vol. XLVI, No. 16, p. 768.]

This patient was treated for dysentery by emetin for eighteen days, taking in all about 1.05 gm. (16 grs.) of the drug. Death was due to dysfunction in the medullary synapses (bulbar symptoms). The author collects records of about thirty cases of toxic action from emetin, proving fatal in quite a number. Toxic action occurred when the dose of 8 cg. was repeated several days in succession.

Comby, J. PAINFUL PRONATION IN CHILDREN. [Bull. Soc. Méd. Hôp., Vol. XLVI, No. 17; J. A. M. A.]

When a child is learning to walk and it falls while its hand is being held by a larger person, the elbow gets a jerk that may displace the head of the radius a little. The result is what Broca called painful pronation, and taught how to cure it by holding the forearm in supination and pressing on the head of the radius while the forearm is flexed on the arm. The radius slips at once back into place. A case is described in which the jerk of the elbow occurred while the babe was sitting in its perambulator. It had hold of the top when the nurse pushed the carriage suddenly forward to escape a vehicle.

Schubert, A. BIRTH PARALYSIS PLUS CONGENITAL DEFORMITIES. [Deut. Zeits. f. Chir., Vol. CLXX, No. 5-6, p. 343.]

A carefully worked out series of observations tending to show that malformations and deformities are so often seen with birth paralysis that the birth trauma should not be held solely responsible. The real trouble lies further back at some hitch in fetal development.

Ott, William O. SCIATICA TREATED BY EPIDURAL INJECTIONS AND REMOVAL OF FOCI OF INFECTION. [Minnesota Med., December, 1921, 718, Annals Surg., Aug., 1922.]

The results in the treatment of thirty-four cases of sciatica by the removal of foci of infection and injection of saline containing novocain are reviewed. In the cases selected for this particular form of treatment a careful attempt was made to exclude sacroiliac disease and diseases of the lumbar spine that might cause the sciatic pain, as well as diabetes, myelitis, syphilis, pelvic tumors, and other common causes of sciatic

pain. The author believes that if all of these conditions which may cause sciatica are eliminated, there is still a group of patients in which the sciatica is caused by infectious processes, the seat of the lesion in the nervous system not being as yet definitely located. Of the thirty-four patients treated by this method, nine patients received permanent relief, fourteen received partial relief, which allowed them to return to work, and eleven did not receive any relief from the injection. Of the nine patients who were completely relieved, foci of infection were removed in five. Of the fourteen who received partial permanent relief, foci of infection were removed in eleven. Of the eleven patients who did not receive any relief, foci of infection were removed in five. The relation between the removal of foci of infection and the relief of sciatica could not be definitely determined. It was noteworthy that several patients were completely relieved by the injections alone. [Author's abstract.]

Martin, E. G.; *idem* and Jacoby, L. A. THE APPLICATION OF THE ALL OR NOTHING PRINCIPLE OF NERVOUS CONDUCTION AND THE INTERPRETATION OF VASOMOTOR REFLEXES. VASOCONSTRICTION FROM WARMTH STIMULATION. [Am. J. Physiol., 1922, LIX, 394, 400, Med. Sc.]

In previous papers Martin has developed the view that the character of vasomotor responses depends on the volume of sensory stimulation and not on the existence of specific nerve-fibers. "Gentle (or limited) sensory stimulation, not arousing mental alertness, typically induces vasodilatation, while reflex vasoconstriction, not dependent on psychic excitation, requires intense or widespread stimulation." In the second paper it is shown that even application of warmth, if sufficiently widely distributed, produces a local vasoconstriction. Immersion of the lower part of the human body in water at 42 degrees C. was followed in seven seconds by a drop in temperature of the skin of the small of the back, averaging slightly less than 0.2 degrees C. This was accompanied by sensations of chilliness and "goose-fleshing." The first deals theoretically with the manner in which vasodilator and vasoconstrictor reflexes are produced. Starting from Lucas's "all or nothing" principle of nervous conduction, it is concluded that the nature of the vasomotor response depends on the number of nervous impulses which arrive within the cerebral nervous system within a given time from a given area of the periphery. The passage of a large volume of nerve impulses along a nerve produces reflex vasoconstriction, a small or moderate volume of impulse streams induces reflex vasodilatation. There is no evidence, at present, of the existence of specific pressor and depressor nerve-fibers in special nerve-trunks. But in view of Ranson's work it must be admitted that within the spinal cord the paths for pressor and depressor excitations are different. It is held that the principle of reciprocal innervation does not apply to vasomotor reflexes.

Acuña, Mamerto, and Bazan, F. RECKLINGHAUSEN'S DISEASE. [Prensa Médica Argentina, IX, No. 1, p. 12.]

A full presentation of this disorder in a girl of twelve who also had congenital syphilis. Also they report on a boy of eleven who had the typical skin discolorations with apathy, mental retardation and very poor memory retention.

Davis, Benjamin F. REPAIR OF PERIPHERAL NERVES. Minnesota Medicine, August, 1922, V, No. 8, p. 474.

This paper is a review of the subject to date. The material is considered in four divisions. The first division outlines the process of repair in properly sutured nerves from the standpoint of gross and microscopic anatomy and physiology. This division may be summarized as follows: In the process of nerve regeneration, the neuraxes arise from intact proximal nerve fibrillae and cross the suture line peripheralward in protoplasmic bands which arise by proliferation of the cells of the neurilemma and which bridge the gap and replace the original nerve trunk. The point of nerve section, if adequately sutured, is bridged and practically restored to normal in four weeks. The second division is devoted to technic. It is pointed out that resort to cable grafts, fascial tubes and other methods of artificial bridging will rarely be necessary if advantage is taken of the means of obtaining end-to-end approximation afforded by mobilization and transposition of nerve trunks, flexion of joints and abduction or adduction of limbs as indicated and by secondary suture several weeks after suture of the ends as closely together as possible with the limbs flexed and gradually stretching by extension. In the third division the question of the recovery of function following nerve suture is discussed and it is recommended that if signs of returning function do not appear in from three to six months, it is wise to make a second operation and examine the nerve at the line of suture. If it is discovered that the continuity of the nerve is interrupted by contracting scar or some other condition at the line of suture, a new suture can be made with good prospects of success. In determining whether neuraxes have crossed the suture line, use may be made of the fact that stimulation of intact sensory or mixed nerves causes reflex stimulation of respiration. If, upon exposing the nerve trunk which has been sutured some months previously and applying a threshold stimulus 2 cm. or more distal to the line of suture, there is no effect upon respiration, it is conclusive evidence that regeneration beyond the line of suture has not occurred and resection of the scar with resuture is then indicated; if reflex respiratory stimulation does appear, it is clear that nerve fibers have crossed the suture line and are on their way down the peripheral segment. Division four of this paper is a summary of the causes of failure in nerve suture. Of especial importance are the factors of cicatrization, improper technic and hemorrhage and cyst formation. Cicatrices may result from involvement

of the suture line in adjacent scar tissue and, in several cases, have resulted from replacement fibrosis of the strips of fat and fascia which had been wrapped around the suture line. To prevent scar tissue formation, it is probably better to refrain from using the fat and fascia strip and to endeavor to place the sutured nerve in normal tissues, preferably in an intermuscular plane. Under the heading of improper technic are mentioned twisting of nerve trunks thus disturbing the nerve pattern, too tight suturing, thus crushing the nerve, disturbing the nerve pattern and folding the nerve on itself; subjecting the suture line to excessive tension so that the nerve ends are pulled apart permitting interposition of scar tissue. Hemorrhage and cyst formation—the latter is probably secondary to the former. Hemorrhage occurs between the sutured ends, the resultant blood clot may be entirely absorbed, it may be replaced by scar tissue, or, if large, it may be encapsulated by connective tissue; under the latter circumstance, the center of the clot may be gradually digested and replaced by liquid, thus forming a cyst. [Author's abstract.]

Janowski, W. NEURALGIA OF ABDOMINAL WALLS. [Revue de Médecine, XXXIX, No. 5, p. 269. J. A. M. A.]

Janowski published in 1906 a study of intercostal neuralgia based on 440 cases. His experience later has confirmed the remarkable way in which intercostal neuralgia may simulate many affections of internal organs. He here presents a similar study of neuralgia in the abdominal wall, and the number of internal affections which it may simulate is even more imposing and puzzling. He reviews the whole list, and relates many cases of what seemed to be grave organic disease of long standing cured by measures to relieve the neuralgia, blisters to the four or five tender points. These painful points vary in location; they may be on the anterior or posterior axillary line when simulating gallstone mischief. The abdominal wall was sensitive in his 10 cases simulating stomach disease, and the tender points were remote from the stomach. The nausea and vomiting in 2 of the cases came on while the women were dressing, fasting. In 7 of this group, pressure on these tender points induced salivation. In 12 cases there had been pains and pyrosis for months. All were cured with a cantharides plaster (*mouche de Milan*) applied to the tender points. In 8 cases the pains seemed to indicate a floating kidney. In these cases the painful points were on the mammary line, two or three fingerbreadths above the umbilicus, or in the eighth or ninth intercostal space. In 6 cases kidney stones had been diagnosed; the painful points were on the mammary line above the umbilicus and on the anterior axillary line. The skin of the abdomen should be taken up in folds from the costal arch across the epigastrium, to detect any extra tenderness. This shows that the painful points are in the skin alone, the muscles, etc., responding with normal sensations on palpation. The cure of the painful points under a blister may be followed by the disappear-

ance of symptoms which have been masquerading as chronic parametritis, appendicitis, enteritis, etc. He advises to palpate folds of the skin of the abdomen whenever any patient complains of pains and says that the abdominal wall is itself extremely tender. The neuralgia of the wall may accompany actual disease of organs, but great relief is realized by curing the neuralgia and thus reducing the clinical picture to this extent.

3. SPINAL CORD.

Ingvar, S. SPINAL DEVIATION OF INTENTIONAL MOVEMENTS. [Act. Med. Scand., 1922, LVII, No. 4.]

Ingvar observed a deviation of the movement of one arm (in pointing to a place), if the person abducted the other arm, and especially if a weight was held in the abducted extremity. The phenomenon occurs only in the Romberg position, and not if the person is seated comfortably. Ingvar explains it as an unconscious compensation to preserve the equilibrium, and believes that the deviations due to the vestibular apparatus are also compensatory balance reflexes.

Krabbe, Knud H. UNUSUAL CASES OF ACUTE ANTERIOR POLIOMYELITIS. [Rev. of Neurol. and Psych., Vol. XVII, Nos. 4, 5, 6.]

Two cases are described, one under three months of age, the other over fifty years. There was a local (Copenhagen) epidemic of poliomyelitis at the time (1919). An autopsy was held in each case. The baby had several gangrenous fingers. In the man, lumbar puncture determined the diagnosis, before death, over a possible thrombosis of spinal vessels. Pneumonia was the cause of death in both cases. [ATWOOD.]

Weill-Hallé, B., and Chabanier, H. TREATMENT OF SCIATICA. [Bull. Soc. Méd. Hôp., Vol. XLVI, No. 25, p. 1145; J. A. M. A.]

A sharp pain in the back of the right thigh was the first symptom in the case described. The pain was continuous and progressive, and the third day it appeared on the other side. The pain spread throughout the entire limb, with a tender point in the ischium-trochanter groove, and on the fibula. There was slight fever, and the man of thirty-two was given an intravenous injection of 1.5 gm. of sodium salicylate in 75 gm. of distilled water. There was a severe chill reaction, with pains in the legs, and the temperature ran up to 105 F. By the next day all the symptoms had subsided, including the pains. In a second similar case the sciatica was very severe and of over five months' standing. It had come on suddenly while walking and had been so severe as to confine the man to bed for months. No benefit was derived from a course of sodium salicylate by the mouth, but improvement followed an intravenous injection of 3

gm., and the sciatica subsided completely under a total of three injections on successive days.

Rosenow, Edward. TREATMENT OF ACUTE POLIOMYELITIS WITH IMMUNE HORSE SERUM. [J. A. M. A., Aug. 20, 1921.]

This observer has found that the intraspinal injection of immune horse serum failed to protect monkeys against intracerebral inoculation of virus, whereas intravenous injection protected them against properly gaged doses of virus, not too far removed from the human source, and that intravenous and intramuscular injections in man gave excellent results. He reports on the results obtained in the treatment of 259 cases by himself and others. None of the sixty patients treated in the preparalytic stage died, and all recovered completely without residual paralysis. Of sixty-one patients, with slight paralysis at the time of the serum treatment, all but one recovered completely, and in this one residual paralysis was limited to the shoulder muscles. Of 123 patients with advanced paralysis, eighteen died. Eleven of these had symptoms of involvement of the medulla at the time of the treatment. Thirty have residual paralysis; in fourteen the late results with regard to the paralysis are not known; sixty-one recovered completely. One of fifteen patients with sporadic poliomyelitis died. Six recovered with residual paralysis. The serum was given late in the disease to all of these patients. Nineteen of the 259 patients treated died, a mortality of 7.3 per cent. If eleven patients in whom serum could scarcely be expected to stay the process are eliminated, there are 248 patients whose conditions might have been affected by the serum. Eight of these died, a mortality of 3.2 per cent. Residual paralysis is known to be present in thirty-seven patients (21 per cent), and if fourteen patients in whom the late results are not known are added, the total might be fifty-one (29 per cent). Of 197 paralyzed patients, nineteen (9.6 per cent) died; eliminating the eleven patients whose cases were hopeless at the time of the serum treatment, the mortality is 4 per cent. Thirty-seven (21 per cent) of the 176 paralyzed patients who survived are known to have residual paralysis. In the fourteen the late results are not known, but, granting that they all have residual paralysis, which, judging by the early findings, is not likely, the total might be fifty-one (29 per cent). This incidence of residual paralysis is far lower than was the average in paralyzed patients in a number of epidemics in Europe. The good effects noted at the bedside following the injection of the serum were in general proportional to the earliness of the injection. They were often striking, occurred after repeated injections, and were independent of the withdrawal of spinal fluid. When improvement occurred, it was with such regularity and in such marked degree in the early cases also excluded accidental occurrence and to indicate that the absence of deaths, the low incidence of paralysis, and almost total absence of residual paralysis are due to the early administration of the serum. The conclusion that immune

horse serum, prepared by repeated injections of increasing doses of freshly isolated strains of the pleomorphic streptococcus, has curative power in poliomyelitis, especially when given in the early stage of the disease, Rosenow asserts, is warranted. Its general use in the treatment of this disease is indicated, and the need for early diagnosis in suspicious cases by spinal puncture is again emphasized.

Aróstegui, G. EPIDEMIC POLIOMYELITIS. [Rev. d. Med. y Cir., Dec. 25, 1922, XXVII, No. 24.]

A small epidemic of abortive cases of poliomyelitis occurring in an Havana institution with 200 child inmates in August is here described. Seven of the children presented symptoms in a mild form, and contacts developed headache, tremor, and a febrile meningeal reaction. In all, the symptoms spontaneously subsided when the children and their attendants were isolated. The upper air passages were systematically disinfected and the children were given sun baths two or three times a day. The prompt recognition and isolation of the early cases evidently aborted the epidemic disease.

Müller, E. AN EPIDEMIC OF ACUTE ANTERIOR POLIOMYELITIS. [Deut. med. Woch., 1922, Berlin letter J. A. M. A., Nov. 11, 1922.]

In various parts of Germany, more particularly in the vicinity of Tübingen and Marburg, during the summer and early autumn, there has been a rather severe epidemic of infantile spinal paralysis. The director of the polyclinic in Marburg, Müller, has given a complete report of the cases observed by him. It is of especial value that Müller is in a position to make comparisons between the present epidemic and the one he witnessed in 1909 in the same region. As to the cause of the present epidemic, he is not prepared to make any definite statements—nor could he in regard to the epidemic of 1909. The virus may have been autochthonous in that section or it may have been brought in from another region. He is convinced, however, that transmission of the infection from one person to another constitutes the most important mode of origin of cases of epidemic infantile paralysis. He found no evidence for transmission through contact with inanimate objects or animals, or through the food intake. Houses which in 1909 were infected with infantile paralysis were not infected during the present epidemic, and the quarters of the city that were almost free from the diseases during the earlier epidemic were the ones that presented the most cases this year. The first focus of infection was located in a group of houses in the southeast corner of a village near Marburg. From here it could be shown that the infection was carried by personal contact to a group of houses in the city of Marburg. To be sure, only a very small percentage of the many persons who came in contact with those infected contracted the disease. We must distinguish between disease transmission and virus transmission. The most

essential protective measure for the body lies in the peculiar ability of the mucous membrane of the nose to neutralize the virus. It is probable that the varying resistance of the meninges of the brain is also an important factor.

Two of the most important predisposing factors in the epidemiology of the disease are the season and the age of the person exposed to the infection. The summer and early fall are the favored season, and children between one and three years of age are the persons most frequently affected. It is true, however, that, during the epidemic this year, children of school age, and even adults, were attacked much more often than formerly. The average mortality was about the same as for the former epidemic (17 per cent). It was greater for children of school age than for the younger children (about 24 per cent, as against 11 per cent), and was greatest for adults. The incubation period averaged about one week. The most frequent premonitory symptom of the disease was an involvement of the respiratory apparatus. Rheumatoid and neuralgiform manifestations were the next most frequent precursors. Psychic changes (sleepiness during the day and restlessness at night) and hyperesthesia were valuable diagnostic signs in the preparalytic stage. Hyperesthesia in the region of the cecum frequently led to the false assumption of appendicitis. In the early stage of the disease there was often a tendency to hidrosis; involuntary jerkings and muscular hypotonia were also noted. A number of cases of infantile bulbar paralysis occurred. Abortive cases were frequently observed. The fatal cases resemble in their progression the course of Landry's paralysis, death ensuing during the first week—commonly on the third or fourth day of the illness. Müller saw little evidence of the good effects of treatment, but he recommends hexamethylenamin in the beginning of the infection.

III. SYMBOLIC NEUROLOGY.

1. PSYCHONEUROSES; PSYCHOLOGY.

Knipping, H. W. BRAIN WORK. [Ed. J. A. M. A., February, 1924.]

As long ago as the eighteenth century, it was noticed by Lavoisier that exercise leads to an increased consumption of oxygen. Ever since that period, evidence has been accumulating to establish the fact that the bodily activities are attended with chemical changes. The liberation of energy proceeds through the transformation of matter stored in the organism. Every type of muscular work adds to the need of food to replace what has been expended in maintaining those inevitable functions that are classed in the expression basal metabolism. The increment of loss through vigorous exercise may amount, in terms of energy, to several hundred calories an hour. Besides the production of waste heat when muscular work is done, there may arise a sense of fatigue.

The feeling of weariness is likewise an accompaniment of mental application, so that it has been quite natural to inquire whether "brain work" also gives rise to peculiar metabolic products and makes increased demands on the energy exchange. Most of us are inclined to assert that mental activity is "hard work"; that it often exhausts us as much as muscular work does. Is the calory cost as great? The extensive investigations of Benedict and Carpenter with the respiration calorimeter in this country are commonly quoted in reply. A group of students took bona fide examinations in a respiration chamber which was at the same time a calorimeter. Each man took his turn, spending three hours over his paper and experiencing the usual anxiety and strain attendant on such a proceeding. On other days, each subject spent a like period in the chamber, engaged in copying printed matter. Thus it was possible to compare in about twenty cases the metabolism of a period of brain work with the metabolism during a time in which similar muscular movements were made, but in the absence of conscious effort. There was no distinct difference. Stiles has recalled a similar result obtained more recently in the case of proofreaders. These persons, he argues, certainly concentrate to good purpose, and it will be agreed that their work is exacting. But it is pursued by the adept with a minimum of postural strain; in fact, it is consistent with very complete relaxation. Waller and de Decker found no change in the metabolism when their subjects entered on or discontinued work.

Bearing in mind that the nervous tissues of the body comprise less than one-twenty-fifth of its mass, one could scarcely expect that even considerable changes in the metabolism of these specialized structures would easily find expression in the sum total of the chemical changes of the entire body. Nevertheless, there are indirect evidences—indications by analogy—that the life of the brain has a very vigorous metabolism of some kind that involves oxygen. Its blood supply is large, and there are biologic provisions to keep it abundant. Despite the failures to detect differences in the total heat output of the body as a result of active intellectual work, Mathews has not hesitated to assert that the activity of the brain and nerve tissues in general is very dependent on oxygen, and that they produce large amounts of carbon dioxid, the amount of which runs, in general, parallel to the state of activity of the tissue.

At the University of Hamburg, Knipping¹ has directed his attention to other possible evidences of metabolism in mental work by examining the blood under varied conditions of intellectual activity. His observations lead him to the conclusion that phosphoric acid is liberated in unusual amounts when the mind is more active. The increments may be sufficient to affect the acid-base equilibrium of the blood. This can be corrected by

¹ Knipping, H. W.: *Respiratorischer Gaswechsel, Blutreaktion und Blutphosphorsäurespiegel bei geistiger Arbeit*, Ztschr. f. Biol., LXXVII, 165, 1922.

inducing a secretion of acid gastric juice, such as is called forth by a good meal. Hence, we are told by the German investigator, it is not more calories but rather a secretion-promoting type of regimen that the brain worker needs for his welfare.

Kooy, F. H. PSYCHASTHENIA. [S. Afr. Med. Rec., Dec. 8, 1923.]

This author, utilizing Janet's faulty conception, distinguishes psychasthenia as a compulsory neurosis from neurasthenia, which is really a member of the intoxication group of neuroses. He approaches the study of the obsessions, which are the characteristic symptoms of psychasthenia, by considering first those mental processes which have compelling force in normal persons and then examining the circumstances in which these processes pass into pathological obsessions. Such compelling forces are the emotions, rhythm and melody, the contrasting of ideas, routine, and the urge to completion. All these are caused by the particular construction of the individual mind, and the fact of its being subject to the laws governing the whole animal kingdom. They only become pathological when they occur in a condition of lessened psychical tension in which the personality is softened and uncertain. They may have existed from early life and have become obvious later as the result of physical disease or certain psychical traumata. Treatment involves attacking the fundamental symptoms, strengthening the personality by inspiring confidence and a feeling of safety and certainty, and regularizing the patient's life by mapping out his routine for the day; each case must be treated individually.

Harman, B. RELIGION AND THE "NEW" PSYCHOLOGY. [B. M. J., January 26, 1924.]

This author contributed recently to the Hibbert Journal an article in which he discussed the bearing of the new psychology upon religion. His arguments are intended more especially to prove that religious conceptions evolved by the intuition of generations of seekers after truth have now been shown by the new psychology to be biologically correct. It is an interesting theme. Human nature has changed but little, and dynamic psychology is now dealing with the same conflicts which have troubled mankind throughout the ages. All great philosophers and religious teachers have recognized that it is not so much the external forces of nature which man has to fear, but the disrupting forces within himself. The contention is that external stresses play only a minor part in the production of neurotic states; they are the product of a disharmony within; the man whose inner life is tranquil and harmonious can meet the blows of fate with fortitude and courage. This is essentially the teaching of the new dynamic psychology. Mr. Harman finds much in biblical literature which accords with the teaching of the Vienna school in its emphasis upon the fundamental influence of sex. He realizes that parenthood, the out-

come of sex, has an immense effect upon the individual and the community, and that there is no social relation which has at one and the same time a greater moderating and a greater stimulating influence. The distortion of the sexual impulse into other than reproductive aims was condemned by the Hebrew prophets and the early Christian teachers. One of the greatest lessons in this connection was given by St. Paul, who was not content to pass over an immorality that had the sanction of national custom, but declared that these deeds were in themselves of the most serious import, involving little less than a perpetual relationship, albeit forged in a momentary action: "He that is joined to an harlot is one body." Mr. Harman rejects the view that the new psychology panders to self-indulgence. It does not say, "resist not evil," but urges the need for a full development of control by facing evils as they arise, overcoming them and not shrinking from the struggle. It recognizes that perpetual struggle which St. Paul so tellingly described in the words: "For the good that I would I do not: but the evil which I would not, that I do. . . . I delight in the law of God after the inward man: but I see another law in my members, warring against the law of my mind, and bringing me into captivity to the law of sin which is in my members. . . ." While this is a confirmation of the doctrine of original sin, or rather bias, it denies the inhuman implications of that doctrine. It says in effect to the sufferer: "Come now, and let us reason together, . . . though your sins be as scarlet, they shall be as white as snow." Finally, we find raised the question whether the new psychology throws any light upon the conception of the soul and the over-soul as the motive power behind all mentality. While Mr. Harman thinks that it brings no evidence to bear—certainly no direct evidence—he suggests that the fundamentals of the new psychology may have an indirect bearing by way of analogy on the problem of the indestructibility of the soul. The body, he says, is a congeries of a myriad cells, each retaining its own sensibility and its reactions in its degree, though all combine to make the sensibility of the whole, and asks why we may not infer a like condition in those limitless extensions of it which we can neither see nor handle, but which we may conceive are there. In these illimitable realms individuality may, it is suggested, be maintained distinct even though it be one with the greater whole. These are speculations, and the soul conception can neither be proved nor disproved. He points out, however, that belief in it has been and now is the mark of some of the most virile peoples of the earth, and that these same peoples have, by a similar process of intuition, arrived at secondary religious principles which are founded on sound biological laws. Is there not, therefore, he asks, reasonable ground for concluding that the summation of those principles—the intuition of the soul and of the over-soul as the essence of all things, and of the indestructibility of the soul—is equally true? We will not presume to attempt to answer this question, but we may observe that the views expressed in the article under consideration as

to the significance of Freud's teaching in respect to immortality will not be readily accepted. It is difficult to see how Freud's teaching has even an indirect bearing on the subject. He is a strict mechanist and determinist, and as a philosopher altogether gloomy and pessimistic. A more fruitful discussion would have centered round Jung's psychological and philosophical teaching. This is closely allied to that of J. S. Haldane as a physiologist and Bergson as a philosopher.

2. EPILEPSIES.

Janota, O. TREATMENT OF EPILEPSY WITH INJECTIONS OF MILK. [Cas. lck. ces., May 5, 1923.]

Janota is skeptical in regard to the alleged favorable results of treatment of epilepsy with parenteral injections of milk.

Riising, J. THE THERAPEUTIC PROPERTIES OF LUMINAL. [Uges. f. Laeg., November 30, 1922, 1671; B. M. J.]

J. Riising is greatly impressed by the hypnotic and analgesic action of luminal, the chief objection to which is its cost. The dose is 10 cg., and it is the only known remedy, he states, that invariably cures hiccup. But it is in epilepsy that its sphere of usefulness is greatest. Given in doses of 10 cg. two or three times a day it arrests the fits completely or renders them less severe and frequent. In some cases the fits are confined to the night after the administration of luminal, which must not be discontinued suddenly for fear of provoking status epilepticus. The action of the drug is merely symptomatic, and while it is being gradually discontinued in epilepsy it is advisable to give bromides. There are no contraindications, and with the ordinary dosage no signs of poisoning have been observed. Eclampsia, tetanus, and delirium tremens are some of the many conditions which react satisfactorily to the drug.

Magauda, P. EPILEPSY WITH MYOCLONUS. [Policlinico, May 28, 1923.]

Two brothers fifteen and seventeen years of age witnessed an attack by armed bandits. After this both developed epileptiform seizures. A year or two later clonic paroxysmal contractions of the Unverricht type took place. An endocrine factor is suggested by a tendency to goiter in one of the young men, now nineteen, and the scanty development of the sexual characters in the other. Psychogenic factors are forgotten in this study.

Kogerer, H. AMMON'S HORN IN STATUS EPILEPTICUS. [Zschr. f. d. ges. Neurol., LIX.]

Kogerer goes further than the hitherto described chronic sclerotic alterations found in epilepsy and discusses acute changes found in a patient who had died in status epilepticus. The ganglion cells were filled with a large number of corpuscles which showed fat stain in scarlet and

in Marchi's stain. The blood vessels were dilated and gorged with blood and in spots changed to hyaline masses. There were lumps of degenerative material within many of them and upon the outer wall.

Geitlin, F. ORGANIC BASIS FOR EPILEPSY. [Fins. Läk. Hand., July-August, 1923; J. A. M. A.]

Geitlin agrees with those who accept a more or less incomplete form of tuberos sclerosis as the lesion in the cortex responsible for certain epilepsies. The foci of sclerosis are always circumscribed, and may be visible, or only perceptible to the touch, or revealed only by the microscope. The foci resemble the lesions of multiple sclerosis of the brain and, like them, are of embryonal origin. In one brain he has been studying, the cortex was scattered irregularly with numerous foci of this kind, and he theorizes that the resulting impairment of cortical function prevented the cortex from exerting its normal inhibiting function on the play of the subcortical centers. When a motor subcortical center became irritated by some toxin, as the restraining influence of the cortex was in abeyance, tonic or clonic convulsions ensued. These convulsions may range in intensity from slight local muscular spasms to the genuine epileptic seizure, according to the extent and intensity of the cortical lesion and of the toxic action. The reason why epilepsy does not occur in all idiots and imbeciles, he suggests, may be because the subcortical centers are too pathologic to respond.

Fischer, H. QUESTION OF EPILEPSY. [Zschr. f. d. ges. Neurol., LVI.]

Fischer sets forth a number of interesting facts in regard to convulsions, which facts themselves stimulate further question regarding epilepsy. He states first that the brain has the capacity to react with convulsions to definite injuries if the stimulus is intensive enough. In man this capacity is of a relatively high degree. Bilateral extirpation of the adrenals in animals made impossible the production of convulsions by the use of amyl nitrite. Fischer made the adrenals the point of attack in experiments with the convulsion producing effect of alcohol on the basis of the vasomotor phenomena of alcohol intoxication, of the experimentally demonstrated increase of the adrenals in chronically alcoholized rabbits and the significance of the adrenals in the convulsive mechanism. He believes that the attack itself is not due to a cortical stimulus but that from its beginning the cortex is excluded. This explains the over-excitability of the subcortical system. The convulsive centers are not localized in the cortex.

Koljubakin, S. L. BLOCKING THE MOTOR CENTERS IN EPILEPSY. [Arch. f. klin. Chir., April 12, 1923.]

This fact procedure consists in injection of alcohol into the centers for the arm, face and leg in two cases of jacksonian epilepsy and in a case of continuous partial epilepsy. The results of thus blocking the

motor centers involved in the convulsions seem encouraging on the surface. The three patients improved, and the trauma of the intervention seemed minimal. He is now studying the influence of alcohol on the central nervous system of animals. He injected into each motor center involved 2 c.c. of an 80 per cent solution of alcohol through two slits in the dura. The normal physiologic relations of the cortex surface do not seem to be disturbed. He mentions Omorokow's experience with resection of the motor centers in 24 cases; in 10 the convulsions ceased and in 3 they became attenuated; in 5 no benefit was apparent, and 5 patients died.

Meyer, O. B. ACTION OF EPILEPTIC SERUM ON ARTERIES. [Münch. med. Woch., October 26, 1923.]

Meyer found that surviving strips from arteries do not contract in serum from epileptics. They present rhythmic contractions in normal serum.

Vollmer, H. PATHOGENESIS OF GENUINE EPILEPSY. [Kl. W., 1923, No. 9.]

The author suggests as the explanation of epilepsy that a periodic metabolic disturbance takes place, the most important feature of which is the alkalosis which increases up to the point of the attack. This signifies an acceleration of metabolism while its effect upon the musculature and the central nervous system results in increase of excitability and the convulsion. The attack in turn denotes a certain temporary self-therapy of the organism through which there is a discharge of phosphate from the muscles and so a returning acidosis.

Rohmer, P. CONVULSIONS IN INFANTS. [Med., August, 1923.]

Convulsions in infants are the rule rather than the exception. Hence he calls them physiological. In 90 per cent of the cases the convulsions are due to spasmophilia. Doses of 12 gm. of crystallized calcium chlorid (or 6 gm. of the anhydrous salt) given in solution daily for two weeks stop the dangerous attacks of convulsions and laryngospasm in the children.

Adie, W. J. PYKNOLEPSY PROGNOSIS. [Proc. Roy. Soc. Med. (Neurol. Sect.), XVI, 19; Med. Sc.]

In an interesting paper the author, drawing upon personal observations and upon the exclusively German literature on the disease, describes a form of minor epilepsy which presents the following characteristics: the onset is explosive, occurring between the ages of four and twelve, the attacks are short, very slight, absolutely unvarying in character and intensity. The limbs relax, but the child rarely falls, objects are rarely dropped from the hands, the color does not change appreciably, there is no mental alarm or physical distress. At most the eyeballs roll upwards, the lids may flicker, the head may be turned to one side, or the arms

raised by a feeble tonic spasm. Chewing or swallowing movements, or clonic spasms of any kind, never occur. At the end of the attack the child behaves as though nothing had happened, and is never languid or sleepy or confused for more than a moment or so. Bromides or luminal have no effect upon the attacks, which may occur in large numbers every day. The attacks persist for weeks, months, or years, without impeding normal mental and physical development, and ultimately cease quite spontaneously, never to recur. In view of the good prognosis of the malady, its recognition is obviously of great importance, since in the case of other forms of epilepsy recovery is the exception, and progressive mental deterioration in children thus affected is the rule. The reader may be warmly urged to consult the original paper. [F. M. R. Walshe.]

Löwy, M., and Pöttyl, O. BILATERAL JACKSONIAN EPILEPSY. [Med. Kl., Oct. 14, 1923.]

A clinical report of a case of endothelioma over the parietal lobe. The patient had attacks of epilepsy identical on both sides. In spite of this, only one side of the brain was assumed to be affected. After removal of the tumor, which weighed 180 gm., the patient recovered.

Pontano, T. REFLEX EPILEPSY. [Policlinico, Sept. 1, 1923.]

This patient had a glioma of the sensorimotor zone. Reflex epilepsy can be provoked only from zones in the skin corresponding to the affected parts of the cerebral cortex.

Wallis, R. L. Mackenzie, Nicol, W. D., and Craig, Maurice. PROTEIN HYPERSENSITIVITY IN THE DIAGNOSIS AND TREATMENT OF A SPECIAL GROUP OF EPILEPTICS. [Lancet, April 14, 1923.]

These authors conducted hypersensitivity tests with five groups of proteins to determine the possibility of food poisons or food susceptibility as a factor in the etiology of certain forms of epilepsy. They used the following groups of proteins: (1) egg proteins; (2) meat and fish proteins; (3) the milk of various animals; (4) vegetable proteins; (5) cereals. The question of the best time to do these tests is of the greatest importance. The test succeeds best when the patient is not fatigued, that is, just before an epileptic attack or as long an interval as possible after the previous attack. In private practice the ideal method of treatment is to remove the offending protein or proteins from the patient's dietary, and, if possible, to desensitize the patient by the administration of protein vaccines in small and graduated doses. Of one hundred and twenty-two epileptics tested, forty-six gave positive reactions to different proteins, and seventy-six gave no reaction at all. The special group appears to be quite healthy, usually inclined to obesity and not excitable or markedly unstable, and gave positive tests. The fact that they do not respond to bromides is characteristic of this group. The results of these tests show conclusively that in some cases where it is possible to adjust the diet on the basis of skin tests, no further treatment is necessary. In some cases

where peptone was given by mouth, the fits became less frequent and in some cases of associated insanity there was mental improvement as well. A very few cases became decidedly worse with peptone treatment. These tests may be used as a guide not only to treatment but also to diagnosis.

MacDonald, M. E., and Cobb, S. INTRACRANIAL PRESSURE CHANGES DURING EXPERIMENTAL CONVULSIONS. [Jl. Neur. & Psych., Nov., 1923.]

During thujone convulsions there is an initial fall in the c.s.f. pressure just preceding the onset of the attack, and a rise in pressure during the fit. Coincident with the fall in pressure there is blanching and retraction of the cortex, followed by marked congestion and bulging. The c.s.f. pressure follows, in general, the curves of the peripheral venous and arterial pressures. There is some clinical evidence that similar changes take place during human epileptic attacks.

Daly, I. DeB., et al. BLOOD SUGAR IN EPILEPSY. [Brit. Med. Jl., Feb. 9, 1924.]

These investigators show that calculations based solely upon the assumption that dextrose is the sole copper reducing substance in the blood are faulty. No conclusive evidence has yet been brought forward to show that dextrose is the only carbohydrate present in the whole normal blood, apart from the question of the presence of α , β or γ forms or mixtures of these. The authors have found that the copper reducing value of the polarimetric solution obtained from dog's blood by the method of Winter and Smith exhibits irregular variations from day to day.

Bigwood, E. J. PHYSICO-CHEMICAL EQUILIBRIUM OF THE BLOOD IN EPILEPSY. [Ann. de méd., 1924, XV, 119-48. Med. Sc.]

There is some biochemical evidence that epilepsy results from the production of a toxic product in the course of a deranged nitrogenous metabolism. According to Danish workers the derangement of the nitrogenous metabolism is caused by parathyroid inadequacy. The author considers that an alteration in the reaction of the blood is an essential preliminary to the production of convulsions by the hypothetical toxin. The alteration is in the direction of increased alkalinity. An increase in alkalinity precedes the convulsion, and unless this change occurs the toxin has no convulsive action. No change in the reaction of the blood is found in petit mal, Jacksonian and traumatic epilepsy, and hysterical convulsions. The treatment of epilepsy should therefore be directed towards producing an acidosis. To this end fasting, a diet rich in fats, or administration of strong acids may be utilized. Gardenal (luminal) produces a rapid and marked fall in the alkalinity of the blood, possibly by depressing the activity of the respiratory center, and thus leading to an accumulation of CO_2 in the blood. Bromides do not affect the reaction of the blood, and appear to act purely as depressants of nervous excitability. [O. L. V. de Wesselow.]

Holström. HYPOGLYCAEMIA AND EPILEPSY. [Ups. Läk. För., 1924, XXIX, 17.]

Dr. Smith Ely Jelliffe of New York, who has read Dr. J. W. Mackay's letter on hypoglycemia and epilepsy in the *British Medical Journal* of December 15, 1923 (p. 1184), sends the following note on the chief points in a paper described as a careful and exhaustive study, with a full bibliography, published by R. Holström on blood sugar determinations in epileptics (*Upsala Läkare. Förhand.*, 1924, Vol. XXIX, 17). It shows, Dr. Jelliffe says:

(1) In attack-free intervals the blood sugar is normal; (2) the blood sugar content is not markedly influenced by adrenaline; (3) the carbohydrate tolerance is normal; (4) the blood sugar volume shows often a wave-like variation up and down which varies from day to day; the depressions more closely correspond with an attack or group of attacks; (5) single attacks produce a rise and a group of attacks sharp oscillations in the curve; (6) at the close of an attack there is no change in the reactivity to adrenaline or to carbohydrates; (7) intravenous injections of cocaine only occasionally cause attacks in which a definite variation in the sugar curve occurs; (8) subcutaneous injections of cocaine only caused abortive attacks in two cases; no attacks could be induced by adrenaline nor faradization of the neck; (9) the observed blood sugar variations have no primary significance; they are the expression rather of the increased tension of the attack in its relation to the vegetative nervous system. [B. M. J.]

Verger, Pauzat, and du Fayet de la Tour. GLIOMA OF THE FRONTAL LOBE AND EPILEPSY. [Gaz. Hebd. des. Sci. Méd. de Bordeaux, XLIV, p. 294.]

The writers have shown to the Bordeaux Society of Medicine and Surgery the brain of a man of thirty-five who had had typical epileptic attacks for nine years before any clear signs of organic disease appeared. He came to hospital in 1922 in a state of violent maniacal excitement with confusional symptoms which lasted for forty-eight hours; he then became an ordinary epileptic without any headaches, vertigo, or psychical symptoms. His attacks yielded to treatment, and then he began to have defective vision; this progressed, papillary stasis appeared, and soon he became blind. There were no localizing signs, and his attacks continued, with only slight intellectual enfeeblement, up to his death. Necropsy showed an enormous tumor occupying almost the whole of the right prefrontal lobe; the rest of the brain appeared intact. Histological examination showed the tumor to be a glioma whose fibrils formed a thick felt-work; in the part examined—which corresponded to the internal frontal convolution—all the nerve cells had disappeared; in front of the corpus callosum the tumor was adherent to the left prefrontal lobe. As a rule, the lesion has to involve both frontal lobes to produce definite mental symptoms. [Leonard J. Kidd, London, England.]

BOOK REVIEWS

Piéron, Henri. LE CERVEAU ET LA PENSÉE. [Paris, Librairie Félix Alcan, 1923.]

The outline of this study is clear and logical; the presentation proceeds along the simple lines of regular sequence belonging to nature itself. In this direct manner, so well adapted to the intricacies of the final phases of the interrelation of brain and thought, the author seeks to fulfill the task he has set himself. This is to clear away much of the obscurity which still envelops the study of mental activity if an explanation of it is sought through anatomy. For here, as he notes, no such wealth of knowledge has been obtainable as in relation to the reflex nervous activity. The facts so far revealed by the study of the brain mechanism do not sufficiently find their agreement in clinical manifestations. His attempt therefore is to chart from the dynamic functional point of view the gradual development of the nervous system, and thus the interrelation of its various parts as they are elaborated into ever-multiplying complexities. Thus the author enlists every form of psychology as well as of physiological reaction, and as he does this proves once more how indissolubly united are the two branches of nervous activity. His belief that in the highly developed languages we have the most marvelously refined revelation of this union has led him to add to his study some very valuable chapters upon normal speech and aphasia.

Berl, Emmanuel. THE NATURE OF LOVE. Authorized Translation by Fred Rothwell. [The Macmillan Company, New York.]

Rarely does one book comprise so much pregnant thought, such stimulus in its clear logic, such fleeting yet harmonious touching of the chords of other men's thought, as we find here. It loses none of these qualities in translation. All are united, likewise, to the service of the author's undistracted pursuit of the nature of love. Love is to him no sentimental abstraction but a thing dynamic and positive, "*the love of life for life.*" Yet this is not given to define it; rather it states the significance, the object of love.

The author's search through the various conceptions of the origin of love accepted at various times; through its appearance as if originating in the subject or arising out of its object; the testing of its biological explanation; all of these and more do not reduce it to any rigid definition. Berl is content finally to leave it as manifest in three distinct elements impossible of further reduction. These are the subjective phase, in which lies its dynamism, causing it a variety of experiences that often mislead the searcher of its nature; the objective phase, where love loses itself in intuition of its object; and

the fusion of these, "the synthesis of the object in all its glory and of desire in all its strength."

If there is a strong element of mysticism in the discussion, toward which the author inclines, his thought keeps itself for the greater part in the clear realm of reality, even as he examines the elusive facts which pertain to feeling. His appreciation of the distinct and indisputable territory and function of psychology is based upon a knowledge of what psychology can do and has done in tracing back one mental state to another and to others still behind. Yet he is not content with the plurality which is quite legitimately the field of psychology; he believes that psychoanalysis falls inevitably into metaphysics when the discovered dynamisms are identified.

White, William A. AN INTRODUCTION TO THE STUDY OF THE MIND. [Nervous and Mental Disease Publishing Co., Washington and New York. \$2.00.]

When Arnold Bennett wrote his little philosophy on the "Human Machine" the world was charmed by its simplicity and effectiveness, and it became one of the best sellers of its time. And yet it was an extremely naïve and inaccurate description of what takes place in the human organism, particularly in those phases of which the world is prone to speak of as mental.

Human engineering is the scientific study of the human machine, and any effort to understand it in the simplest and most effective manner is to begin with the captain of that machine, the "human mind." Any simple statement, therefore, which will help us in understanding the transcendent importance of mental activities must be welcome. Complex psychologies we have, almost *ad nauseam*. They often bewilder the student much more than they enlighten him, and it is with a sense of distinct relief and unbounded pleasure that we read the singularly lucid and at the same time scientific pages in this delightful little book.

Dr. White has again shown his singular ability to present complex and subtle problems in simple and at the same time correct language. Here is a medical psychology free from useless terminology and full of direct, straightforward descriptions of every day behavior.

Such a book can be read by anyone, scientist or layman, and be of fundamental enlightenment. The newer psychology of behavior is here treated in primer form, but such simplicity clothes the most abstruse truths in comprehensive and understandable language.

Ewald, G. TEMPERAMENT UND CHARAKTER. [Julius Springer, Berlin.]

The "Monographs of Neurology and Psychiatry" published by Springer and edited by Foerster and Wilmanns continue to show the high character for originality and technical construction which have been frequently commented upon in these pages. This is Vol. 41 of this interesting series, and the author, Assistant Professor of Psychiatry in the University of Eriangen, sets himself the task to clarify

our definition of the generalized conceptions which are more or less current under the symbols "Temperament and Character."

These designations are employed by everybody and in general lay parlance are thought to be fairly well understood, but if one were pinned down to the task of precise formulation we suspect the average as well as the superior intelligence would be put to it to devise formulae which would pass muster.

In recent years the efforts at putting these conceptions upon a firm basis have been numerous, chiefly stimulated by Kretschmer's interesting work on Bodily Formation and Character, where anthropological data are largely utilized to show that characterological types may be coordinated with bodily structure. Less valuable half-baked efforts are numerous, and endocrinological speculations have been made to pass muster as bases of temperamental and characterological description. The "psychological testers" have had their fling at the problem with many amusing formulae.

Ewald's effort here presented starts from general biological considerations, and evolves to general psychological conceptions which are most ably set forth. Naturally heredity must first be dealt with. Here Johansen's formulations of the genotype and the phenotype are utilized and inborn-endogenous character, and its relationships to the milieu-exogenous factors, discussed. "Disposition" as a concept thus enters into the problem in its hereditary-endogenous relationships.

Much as we would wish to present a complete analysis of the author's handling of his theme, we are constrained from doing so by lack of space, and can only offer our summary of his endeavor as constituting a definite and valuable achievement in clarifying this general problem of so much importance in modern psychopathology. His outlining of the affective factors, and their paramount significance, as underlying a real understanding of these conceptions, is valid and illuminating, and although we cannot refrain from adding that his final characterological criteria are quite too formal and doctrinaire, we cannot but feel that Jung's "Psychological Types" is a much more valuable contribution to this vexed problem.

Claude, Henri. PRÉCIS DE PATHOLOGIE INTERNE. MALADIES DU SYSTÈME NERVEUX (CERVEAU, CERVELET, MÉNINGES, PÉDONCULES CÉRÉBRAUX, TUBERCULES QUADRIJUMEAUX, PROTUBÉRANCE, BULBE). Bibliothèque du Doctorat en Médecine, Publiée sous la direction de A. Gilbert & L. Fournier. [Librairie J.-B. Baillière et Fils, Paris.]

The complete title of this book conveys an idea of its detailed presentation of the various parts of the nervous system in their relation to the pathology of the organism. The well-arranged topical manner in which the author has set forth the various disorders which are found, and which may to a certain degree be definitely referred to anatomical divisions of the nervous system, make of the book a ready means of reference for the student or practitioner confronted by the perplexities of diagnosis. Yet is this the entire aim of a work of such authoritative completeness on its purely descriptive side? Could

not the author have given one suggestive hint that these diseases, usually complicated even from the anatomic point of view alone, are after all some form of expression, pathological, of an organism behind the imperfect mechanism? Surely the psychologic approach plays a large part in therapeutic understanding, as it must to an ever greater extent in grasping the many complexities of any nervous and mental disease. Even a work purposely devoted so exclusively to symptomatic description needs the psychologic illumination.

Magnus, R. KÖRPERSTELLUNG. [Julius Springer, Berlin. \$6.45.]

It so happens that this particular volume has been lying upon the reviewer's desk for the past three months. During this time certain special interests have demanded a review of the neuropsychiatric literature of the past two years. Many titles have passed under critical scrutiny and many pages of manuscript dictated. Finally this volume, which summarizes some ten or more years of work of a professor of pharmacology in the University of Utrecht, was reached, and it seemed that this monograph, with perhaps a bare handful of associates, could be signalled out as the most outstanding contribution in this period. The von Monakow Festschrift, Dresel's and Müller's contributions to the Vegetative Nervous System, Cajal's Festschrift, the monographs of Stekel on Fetischism, of Jacob's on the Extrapyr- amidal Diseases, Lewy's Muscle Tonus, Laignel-Lavastine's work on the Sympathetic, The Boumann, Brouwer's *Leerboek der Neurologie*, Henning's *Der Geruch*, the translation of Vaihinger's *Philosophy of the As If*, Tilney and Casamajor's studies on the Structural Correlates of Animal Behavior, and Kafka's *Vergleichende Psychologie*—these have seemed to this weary reviewer the associates of this, to him finally the worthy-to-be-accorded Nobel Prize winner in the special field under survey.

The study of the segmental reflex systems of the animal phylum, which obtained its initial real foundation in Sherrington's *Integrative Action* monograph, culminates in this contribution after some fifteen years of intense analytic research.

It was from 1909 that Magnus dates his initial interest in this work, stimulated by a chance observation that a decerebrate cat with a transverse thoracic spinal section showed a marked forced extended position of his fore limbs. From this point on a persistent and consistent plan of studies to understand the reflexes which underly the position and posture reactions were carried on by him and his associates, most of the results of which are to be found in the physiological literature, notably in Pflüger's "Archiv."

The "Magnus-de Kleijn" reflexes, now a byword in neurological nomenclature, and made available to English speaking neurologists from time to time by the masterly reviews of F. M. R. Walshe, are but a small part of the physiological formulations which have come to us from these researches, and which have most opportunely been brought together in this most masterly monograph of some 750 pages.

Stated very briefly, the material here presented, as chapter headings, comprises General Survey, Schaltung, Posture, Compensatory

Eye Positions, Fixed Reflexes, Results of One Sided and Two Sided Labyrinth Extirpation, Labyrinthine Reflexes and Progressive Movements, The Function of the Otoliths, The Centers of Bodily Posture, The Action of Poisons, and The Bodily Reflex Postures of the Newly Born. This abrupt summary is but a thumb-nail sketch of a rich collection of physiological experimentations, serial section studies and penetrating analyses of the reactions of the bodily musculature to the influences of gravity and inertia which in the many millenia of animal evolution have built up the masterly mechanisms of man's capacity to orient himself in space and to guide and control his power over the reality of his environment.

No student of neurology, in its broadest and deepest aspects, can neglect this important contribution.

Fraser, Donald. CLINICAL STUDIES IN EPILEPSY. [William Wood and Company.]

There are a host of older works upon the epileptic phenomena, but of late years no large monographic treatments have been forthcoming—unless one classes Muskens' physiological study as such.

The present work certainly does not get us much further than Hughlings Jackson; in fact, we suspect does not even go as far as this incomparable master of the Victorian period, for he certainly fails to grasp Jackson's level hypothesis, and does not take us into his clear vision of low-level fits, nor into his equally interesting "symbolic level" activities, save for a few foolish derogatory remarks regarding these same "symbolic level discharges," concerning which Jackson would certainly have recognized "unconscious emotional storms" and known how to deal with them, had he the later information of the students of the "unconscious" in a better form than Samuel Butler gave it.

Thus apart from an interesting case report of Hughlings Jackson these studies lead us to no important advance, particularly not as to justify the subtitle, "bearing on the pathogenesis of idiopathic epilepsy." It has some desultory case reports, some material which should have been better correlated with present day knowledge concerning vasomotor regulation of cerebral vessels, and some tumor cases, tuberculous and syphilitic cases—quite apart from idiopathic epilepsies.

The book is sincere, but the author has not yet come up to the classics, such as Binswanger and others, in his grasp of the entire situation.

Korzybski, Alfred. MANHOOD OF HUMANITY. THE SCIENCE AND ART OF HUMAN ENGINEERING. [E. P. Dutton & Company, New York.]

The author has an earnest purpose in this book. He calls attention in a novel and forceful way to the need of humanity to awaken from its all too prolonged childhood. It is time that it finds itself adult to proceed scientifically upon that path of progress which is peculiarly humanity's own. Korzybski may be forgiven the somewhat marked

overemphasis upon his point of approach to this problem as the one panacea for man's salvation and almost as a first discovery of manhood's neglected recognition of itself. For he has clarified the problem by his mathematical statements, and this method of appeal will also have its special appeal to many readers.

He demands that we awaken to the fact that man is neither an animal nor a hybrid between the animal and the supernatural. Both concepts have so superimposed themselves upon all the past that man has overlooked the important thing that separates him infinitely from the forms below him and yet places him quite in the natural course of evolution. This the author calls the "time-binding" capacity—some might call it human consciousness with its power of unbroken memory, too often deeply hidden from the acting point of conscious life. Thus the author, too, finds that man, paying attention to his domination in space, has neglected this other decisive factor. This is his ability to progress because he binds his past with the present and future and so may preserve and further his achievements. In appreciation of this, therefore, of all his past history, lies the opportunity scientifically to enter into adulthood and direct progress. Here we must take cognizance of another neglected fact to which humanity's great upheavals are due: that mankind in numbers and the sum of its material achievements increases by geometrical progression; while its ethical advance, the power to make achievement really progressive, is only arithmetical in its course.

Semon, Richard. *THE MNEME.* Translated by Louis Simon. [The Macmillan Company, New York.]

Semon, Richard. *MNEMIC PSYCHOLOGY.* Translated by Bella Duffy. With an Introduction by Vernon Lee. [The Macmillan Company, New York.]

In the April issue, 1923, of this *JOURNAL* a review of Richard Semon's life was contributed by the Editor under the title, "The Mneme, the Engram and the Unconscious," in which the chief contributions made by Semon to "Organic Memory" in its biological settings were set forth. These two books were there reviewed from their German sources. The English student of biology, and particularly in those aspects of it which are termed memory, habit, instinct, etc., is specially fortunate with these two masterly translations.

Like many another great investigator who has found it necessary to create new terms for new concepts, Semon's terminology was a hindrance to the spread of his fundamental and vitalizing thought. It was only after Francis Darwin, in his address before the British Association for the Advancement of Science in 1908, that other than German biologists became acquainted with the work, although among neurologists, such as von Monakow and others, his conceptions soon found application.

Starting from the earlier sensory physiological work on stimulus as advanced by Hering and Mach, Semon developed the idea that experience bit into protoplasm, as it were, and engraved itself upon it in the form of modified response. Hence his first conception of

"Engraphy." The capacity for reaction to these engraphic stimuli makes up the "Engram." The "Mneme" is the accumulated inheritance of after effects of stimulation, something wider than memory, deeper than habit, and not quite to be summarized under instinctive action. Just in what manner various organisms build up the series of fundamental reactions—mnemic principle—which permits regular energetic distribution in stereotyped, as well as new, evolutionary forms, these two works show in a very fascinating manner.

For a further review of these works we refer our reader to the article already quoted in the JOURNAL, but they should be read by every student of neurology or psychiatry who is still floundering about for better working conceptions of memory, habit, instinct, association of ideas, conditioned reflexes, complexes, etc., etc.

It should be added that Vernon Lee's Introduction to the Mnemic Psychology is a welcome adjunct to the book.

Jones, E. GLOSSARY FOR THE USE OF TRANSLATORS OF PSYCHO-ANALYTICAL WORKS. Supplement No. 1 to the International Journal of Psycho-Analysis. [London. 2/6.]

The psychological and psychiatric public are indebted to Dr. Jones and his collaborators for this exemplary glossary of psychoanalytic terms, prepared primarily for translators of works upon *psa*. Such a work has long been needed as so much arbitrariness in translation has been indulged in, at times completely changing the translation and introducing confusion. Rivers persistently translated *Verdrängung* as Suppression, although Repression had been the accepted translation for years. Similar efforts at priority are all too widely observed, especially by many who by thus twisting a word meaning think to have achieved some preëminence over the original user of the word, or to have said something new because of a personal word coinage.

Fortunately this exemplary glossary will afford a sound basis for mutual understanding and provide that careful technic in translation which is so essential.

Meyers, Milton K. LANG'S GERMAN-ENGLISH DICTIONARY OF TERMS USED IN MEDICINE AND THE ALLIED SCIENCES. Third Edition, Enlarged. [P. Blakiston's Son & Co., Philadelphia.]

This new edition of Lang's German Medical Dictionary is most welcome. We have found it an invaluable work and in its new form much enriched in neuropsychiatric terms, as well as with others in other specialties. We still note deficiencies in the terms of psychiatry, and many psychoanalytic terms are absent or faultily rendered. Thus "*verdrängung*" means *repression*, rather than *displacement*—"ver-schiebung"—faults which the recent glossary issued by the International Journal of Psycho-Analysis will tend to correct when incorporated in a new edition. The psychological terms are also in need of expansion.

Dictionary making is an extremely difficult task. We congratulate the author upon the excellent service he is rendering to the wide-awake and noninsular student of medicine.

Gordon, Alfred. FRENCH-ENGLISH MEDICAL DICTIONARY. [P. Blakiston's Son & Co., Philadelphia.]

This new printing with additions of Gordon's excellent French-English Medical Dictionary will be even more appreciated after the war than ever. Thousands of physicians who hardly ever thought of the existence of foreign languages have come to a realizing sense of the great value that comes through international contacts. Medicine has always been highly international, more so than almost any other applied science, and Dr. Gordon deserves much praise for this most creditable work.

We hope to see a new revised edition demanded, and soon, when many of the newer terms may be incorporated.

Lowie, Robert H. PRIMITIVE RELIGION. [Boni & Liveright, New York. \$3.50.]

Nietzsche in his earlier years was prone to regard religion and the belief in God as a "pathetic myth." There was for this brilliant but still undeveloped intellect—cut short by paresis—a necessity for the invention of religious fictions which, had he lived, would have been better understood as to their dynamic significance in the discharge of the libido of the individual and of the group.

Any work that can throw light on this principle of sublimation of libido demands attention. The present work is largely historical and documental, but it is justified, as also a contribution to dynamic psychology.

It is particularly interesting in that it deals largely with the religious concepts of the North American Indian. Here is rich material for a deeper sifting than the author has attempted.

It is most entertainingly written and is to be recommended.

Adlersberg, D., and Porges, O. DIE NEUROTISCHE ATHMUNGSTETANIE, EINE NEUE KLINISCHE TETANIEFORM. [Urban und Schwarzenberg, Vienna, 1924.]

Adlersberg and Porges would erect a new clinical form of tetany which they term "neurotic" and which is conditioned upon hyperventilation of the lungs. As has been known since Vernon's experiments in 1909 and for some years previously, excessive breathing may cause a relative alkalosis of the blood from too active an oxidation, which secondarily, by faulty calcium supply or overcalcium utilization, leads to that type of hypermotility often designated as tetany, or spasmophilia. They here separate it from other tetany types and report twenty-one cases arranged under three rubrics: (1) Acute cases, eight in number, occurring in excitable nervous women between twenty-three and fifty years. The breathing attacks which led to tetanoid symptoms followed some shock which led up to a high grade of excitement with dyspnea. Group (2): Cases with a chronic course on an encephalitic or hysterical foundation. Here five cases are reported, one excellent pneumograph, in a so-called "hysterical" patient. Here the forced breathing attacks are accompanied by the

tetany-like cramps, the changes in the CO_2 blood concentration, the pH and the calcium content. Group (3) takes up eight cases where breathing attacks accompany cardiac disease (mitral) with or without other valvular defect. Six had a perpetual cardiac arrhythmia.

This is an interesting study which should be read with the work of Rosett, which does not seem known to these workers.

May, James V. MENTAL DISEASES. A PUBLIC HEALTH PROBLEM. With a Preface by Thomas W. Salmon. [Boston, Richard G. Badger, The Gorham Press.]

May discusses mental diseases as to their nature, as each one is an individual problem in itself. He is concerned with the significance of their incidence to the community. He reviews society's attitude to them in the past in the gradual development of care for them based on increasingly intelligent recognition of their nature. On this background, however, he points out emphatically the demand for greater enlightenment through a greater statistical knowledge so that definite action may be taken upon the individual and social problems which mental disorders entail. He attempts in his book the correlation of the scattered material; he cites freely from eminent authorities as they have presented various forms of mental disease with their diagnostic features. Therefore the book forms a comprehensive summary of information. The older descriptive and definitive method is in general followed, as it must be. The newer attitude which has dislodged much of the older conception, more interested in variableness of functional manifestations than in classifications and terminology, is, however, not unheeded by the author. In this field this is an admirable volume.

Lange, Johannes. KATATONISCHE ERSCHEINUNGEN IM RAHMEN MANISCHER ERKRANKUNGEN. MONOGRAPHIEN AUS DEM GESAMTGEBIETE DER NEUROLOGIE UND PSYCHIATRIE. [Herausgegeben von O. Foerster-Breslau und K. Wilmanns-Heidelberg, No. 31, Berlin, Verlag von Julius Springer.]

Lange's study of the catatonic symptoms which appear in manic-depressive cases is based upon the assumption that the latter form of disease constitutes a definite entity. Aside from this accepted concept, tacitly made the ground for the author's investigation, the book is written in no dogmatic spirit of foregone conclusion or of too readily won conviction. It bears rather the stamp of uncertainty, of interrogation, which invites participation in its clinical research. The author's inquiry lies within the realm of cause, form of appearance, course, and outcome, so far as possible to be followed from clinical material assembled with circumspect regard for its validity. He examines the appearance in manic-depressive patients of all the range of symptoms which may be counted in the catatonia commonly associated with schizophrenia. He distinguishes between the appearance of isolated catatonic symptoms, which may be found in average individuals under certain conditions, and the regular occurrence of these at some time or other in almost all the patients studied. He

raises the question of a common inheritance for schizophrenia and manic-depressive disease which might give the ground for such frequent appearance of these symptoms, especially when they are present with clouding of consciousness or in mixed states, where external causes seem to offer no explanation. Yet he admits the slender foundation for establishing the hereditary factor, although he still asks whether there is not such a specific heredity upon which responsible external factors may act in certain cases. He finds from his material examined that in children and old people the schizophrenic symptoms are more in evidence than in individuals of the intervening periods, but believes this is due to the effect of external causes, among which are the psychic instability of childhood and the waning of higher psychic control in the aged. Only rarely do infectious or organic diseases seem to precipitate the schizophrenic character in manic-depressive disease, though alcohol, and perhaps scopolamin, does produce this effect. Childbirth, contrary to common opinion, does not. With congenital feeble-mindedness the symptoms are vague and obscure, but excitement and stupor severe. Association with hysteria was found to present an unusual picture.

Martelli, Carlo. *LA SIFILIDE IGNORATO E STRANA.* Seconda Edizione, con figure e tavole a colori. [Napoli, Casa Editrice Libreria Vittorio Idelson.]

Syphilis is elaborately discussed in this volume with a thoroughness which permits of no escape from any practical phase of diagnosis or therapy. The author's purpose is sincerely to counteract the attitude of carelessness through overconfidence and half knowledge of a subject which, perhaps in Italy more than here, suffers from a pseudoscientific popularity.

Martelli advocates undelayed diagnosis and shows the value of various forms of treatment according to the indications of the form of disorder and the results of applied treatment under the most watchful surveillance. His attitude is eminently practical and pragmatic, not one bound to theories. Treatment too must be immediate with first attention given to removal of the primary syphilis when careful examination may follow to determine in what direction the patient shows a tendency for after effects. Emphasis is laid upon the many points of attack through which the infection may invade the organism and with this the opportunity as well as the necessity for the broadest attitude in inspection of the patient and in readiness to meet every emergency.

A very rich bibliography, topically arranged, is appended to add to the value of the book, although all titles have been rendered into Italian, whatever their original form.

N. B.—All business communications should be made to *Journal of Nervous and Mental Disease*, 64 West 56th St., New York.

All editorial communications should be made to Dr. Smith Ely Jelliffe, Managing Editor, 64 West 56th St., New York.

The Journal OF Nervous and Mental Disease

An American Journal of Neuropsychiatry, Founded in 1874

ORIGINAL ARTICLES

A NEW DIAGNOSTIC SYMPTOM FOR THE RECOGNITION OF IDIOPATHIC EPILEPSY IN ITS INTERPAROXYSMAL PERIOD; WITH AN EXPERIMENTAL STUDY OF THE PATHOLOGY AND EUGENIC IMPORTANCE OF THIS NEW SYMPTOM.*

BY LASZLO FOCHER, M.D.

OF BUDAPEST, HUNGARY

The sole basis of the diagnosis of epilepsy in most cases is the epileptic fit, as the other characteristics of this disease are really very rare and slight. Epileptic psychoses are present only in a small percentage of confirmed cases of epilepsy, or the *habitus epilepticus*, the recognition of which is totally subjective, while its presence merely strengthens the probability of the epileptic origin of a complaint otherwise suspicious. Hence it follows that in most cases our only aid to diagnosis is the epileptic seizure itself. In fact, the differential importance of every clinical manifestation of the paroxysm has been rightly doubted by one author or another,¹ while

* In this study "epilepsy" means a disease of paroxysmal nature, characterized by general convulsions and total unconsciousness, which occurs periodically and is caused by endogenous factors, and cannot be explained by a focus in the brain, viz., idiopathic epilepsy.

¹ For instance, the aura, general convulsion, loss of consciousness—which as is well known can be found in hysteria. Serog (55) denies that even the paroxysmal light-stiffness during a seizure is a sure sign of its epileptic nature; Kraepelin (36) declares the epileptic seizure to be in itself an unpathological process, only its cause being pathological and the changing aspect of the paroxysm being of no importance with regard to the diagnosis. I myself (43) have also observed and described a paroxysm of typical hysteric convulsions, which—associated with other phenomena of hypertonicity of the vagus system—commenced with a maximum myosis, thus, *ipso facto*, with light-stiffness in one side; during the paroxysm the pupil gradually grew larger, giving place to a relative myosis and a slowly returning normal light reflex.

the whole seizure in itself is so characteristic that it rarely happens that after the personal observation of an expert neurologist any doubt remains as to the nature of a paroxysm.

The situation is quite different when the diagnostic consideration of the clinical manifestations of a seizure that has passed, depends only upon data obtained from lay persons who happened to see them. In such a case we cannot draw conclusions in any way from the data given by the patient or his family, and we cannot utilize more in the diagnosis than the complaints of convulsions associated with a condition supposed to be transient unconsciousness, because we do not know the apperceptional activity and memory of these observers and we cannot estimate the influence of the excitement caused by the paroxysm upon the exactness of their apperceptional ability. Further, we cannot judge what influence public opinion in connection with these seizures and the patient's hospital experience—which so many had in the war—have upon his apperception and memory. When the examination is not made for purely medical purposes, but in order to enable the physician to issue a certificate indicating the condition, we have to suspect, besides the previously mentioned motives, also the possible intention to deceive on the part of the examined person or of his family. If personal observations of a paroxysm are not possible, we have no other aid but the objective examination of the patient.

This examination, however, does not enable us to distinguish all convulsive nerve disorders from epilepsy, but only a part of them: Jacksonian epilepsy, eclampsia, the various convulsive attacks: of parietic dementia, of brain arteriosclerosis, of uremia, of coma diabeticum, etc., etc.

Omitting the very infrequent psychosis epilepticus, which is of significance only in a positive case, or the *habitus epilepticus*, that only differs quantitatively from the normal, being therefore difficult to use in diagnosis, we have no lasting symptoms which are characteristic of epilepsy or of hysteria, nor any symptoms which are inseparable either from epilepsy or hysteria. We are therefore quite ignorant in a negative case whether the patient is suffering from epilepsy or from hysteria.

Considering the great importance of the diagnosis, not only in theory but with regard to therapeutics, to prognosis, to the descendants and to the social position of the patient, it will not be found surprising that a great number of authors have claimed to arrive at a diagnosis independently of the fits. This question became a burning one during the war, when most of the beds—always too few—

reserved for nerve disorders at the hospitals were occupied by epileptics waiting for their seizure.

Benedict (15), Schöler (34), and Benedek (31) proclaim the importance of diagnosis in the interparoxysmal period, particularly when the patient enlists for military service. Schultze (33) even declares the common observation of numerous patients of this kind to be very dangerous on account of psychical infection. Moreover, the duration of a seizure is often so short that even the house physician frequently reaches the patient too late.

The methods which facilitate the recognition of epilepsy may be classified into three groups: (I) those which seek, by means of postconvulsive symptoms, to identify a seizure just over; (II) those which bring about a complete seizure at any given time suitable for observation; (III) those aiming at a diagnosis made independently of the paroxysm.

I. Some authors, those who endeavor to diagnose the results of the paroxysm just over, seek to point out the essential features of the postconvulsive period by means of some phenomena—such as Babinski's reflex, the changes in the urine, the picture of the leucocytes, the manifestation of the postconvulsive suffusions—in addition to the well known postparoxysmal sopor, which owing to its notoriety easily lends itself both to conscious and to unconscious imitation. Jelinek (18) thinks the postconvulsive reflex of Babinski is of the greatest importance; this, he states, appears immediately—exceptionally in one or two minutes—after every definite epileptic seizure, and lasts from three to five minutes. The same reflex may in his opinion not be brought out during the fit, only after it; but then it may last exceptionally ten to twenty minutes or even three-quarters of an hour. After the seizure Redlich (40), Quensel (51), and Serog (55) often saw, and Schultze (33) saw in about 50 per cent of epileptics, a positive Babinski, which—in Schultze's opinion—may last some hours. According to Redlich it may be present even during the seizure, though less suggestive than after it. As a characteristic in the postconvulsive period Quensel considers Oppenheim's reflex of equal importance as Babinski's reflex. Benedek (47) in spite of his very frequent efforts very rarely succeeded in bringing about a Babinski's reflex either during or after the fit. Schultze (33) greatly doubts whether the postparoxysmal transitive albuminuria—though speaking in favor of epilepsy—can decide the diagnosis. Quensel (51) thinks leucocytosis, present in the postconvulsive period and lasting sometimes several hours, a characteristic of epilepsy. According to the researches of di Gaspero (32) the

leucocytes are as a rule increased in the interparoxysmal period, but immediately before the fit they are often reduced, and this reduction is associated with eosinophilia, with relative leukopenia and relative lymphocytosis. This condition of the blood changes in the postparoxysmal period—though sometimes during the paroxysm—into a hyperleucocytosis with hypereosinophilia and relative lymphopenia. The doctrine of the eosinophilia in the postconvulsive period is also supported by Redlich (40). On the other hand Bossard (39) and Weissenfeld (44) think that postconvulsive multiplication of the blood corpuscles caused by lymphocytosis is characteristic of epilepsy. Flatau (23), Schultze (33), Jellinek (18), and Quensel (51) have directed attention from the diagnostic point of view to the postconvulsive suffusions.

II. Some authors are not content with the prolongation of the time for the identification by its effects of a seizure just over, but—as if diagnosis may not be separated from the fit—they have striven to work out methods, which will cause the seizure, the only sure characteristic of epilepsy, whenever they please. For this purpose they have tried various drugs, and physical and psychical methods.

Among the drugs cocain has been the most used, though observers have tried adrenalin, cooking salt and alcohol. Agreeably to the proposal of Wagner v. Jauregg, Jellinek (18) experimented in 100 cases with subcutaneous injections of cocaine, 0.05 gm. in each case, but no typical attack followed except in two cases; two other epileptics—who had had a seizure in the preceding twenty-four hours—showed a typical aura and an abortive attack. Lévy and Pach (19) caused, with twenty-five epileptics, seizures to thirteen patients in twenty-four hours, and to one patient a seizure in thirty-six hours after the application of 0.03 gm. cocaine given by subcutaneous injections. Buschan (57) and Benedek (47) also adopted this method; the former with nineteen epileptics caused seizures to six patients, the latter with one cortical and eighteen idiopathic epileptics to nine patients, the seizures quite corresponding to their spontaneous attacks. The experimental results of Sauerbruch (see 28) support the method and at the same time show that great caution must be observed in these experiments, as he found that monkeys with artificially injured motor regions, which had had no paroxysm before the cocaine injection, reacted with a typical seizure to a dose of cocaine so small that it had no effect on the control animals; and this artificial seizure spontaneously recurred after some repetitions of the cocaine injection. Pandey (26) considers the cocaine injection a method fraught with considerable danger without any special diag-

nostic value either in a positive, or in a negative case. On account of its ineffectiveness Siebert (29) is also opposed to the cocaine method, as he had seen with forty-one epileptics only one positive reaction, and this one showed both before as well as after the injection a number of spontaneously recurring fits. Quensel (51) and Schultze (33) oppose all methods of artificial provocation on the ground of their danger. Benedek (31) administered 1.0 to 1.5 c.c. tonogen (sec. Richter)=1 per cent adrenalin to nineteen epileptics, seven hysterics, five suffering from various psychoses, and eight sound persons; among the nineteen epileptics a typical seizure ensued in seven cases in one and one-half hours, while the others—omitting about 25 per cent of them who experienced some subjective discomfort—appeared to have had no reaction. Lévy and Pach also tried, but failed, to cause an epileptic seizure by means of vasoconstrictors. Munier (46) is also doubtful as to the wisdom of giving for the purpose of the artificial production of seizures drugs which have the power to transform the tonus of the vegetative nerve system, as he had seen a young soldier with obvious symptoms of spasm of the vagus center but not suffering from epilepsy, who was overwhelmed by a typical epileptic seizure as the result of pressure on his eyeballs. Böttcher's case (41) is perhaps of equal importance. A woman of thirty-five years, who lived without epileptic phenomena until, after mushroom poisoning (*amanita phalloides*), had an epileptic form of seizure, which recurred every four weeks thenceforth.

In connection with the artificial provocation or seizures by alcohol, Schultze (33) has experimented with very occasional success. This author found the method of cooking salt also untrustworthy and of too long duration. Benedek (47) has also had unsatisfactory results, as, except in two cases, he could not with sixteen positive epileptics cause a fit with these drugs.

Rosett (58) holds that the manifestations of hyperpnoea should, in connection with the different affections of the nervous system, be characteristic enough to be of assistance in the diagnosis and localization of this disease.

According to Foerster's (52) experiments excessive respiration for ten minutes causes in epileptics—in 55 per cent of forty-five persons—epileptic fits which are a true repetition of their spontaneous seizures. Hysterical patients are said to get hysteric fits (one case) by the same procedure, which would have no effect of this sort on normal persons (Foerster and Freudenberg). Foerster has also found (52) that this so-called hyperventilation raises in epileptics

the galvanic irritability of the peripheral nerves to an incomparably greater degree than it is in normal or hysterical persons.

To cause a typical attack Tsinimakis (17) recommends the compression of the carotid arteries until loss of consciousness ensues. He has practiced this method on nine epileptics suffering infrequently from seizures, on one hundred epileptics frequently suffering from seizures, on seven Jacksonian epileptics, on forty-two persons suffering from hysteric convulsions, and on thirty-three sound persons. The hundred epileptics with frequently occurring seizures, the Jacksonian epileptics and the forty-two hysteric persons had typical seizures after this procedure, all corresponding to their usual fits, while the others remained free from attack. After the compression of the carotids for ten to thirty minutes Oeconomakis (22) found in sound as well as in sick persons a state of unconsciousness connected with symmetrical or only one-sided convulsions. Pandy (26), Schultze (33), and Quensel (51) declare this procedure to be very dangerous, and point out the great responsibility which is undertaken by the physician when applying this method.

The opposite side of the picture is shown in Neutra's (25) experiment; he recommends the suggestive provocation of an attack for the purpose of separating epileptic and hysteric fits from each other; a positive result may prove hysteria. This experiment is, in my opinion, of little if any importance, as the hysterical disposition sufficient to respond to suggestion can be found in many epileptic and practically sound persons.

III. In practice the most useful symptoms are no doubt those which are constant and by that very fact independent of the fit. To these belong the above-mentioned epileptic psychosis and epileptic habitus, both occurring very rarely and only in advanced cases. Benedict (16) adds to these signs his cephalometrical formula. In his opinion the left half of the normal cranium is always better developed than the right one; and the absence or the reverse of this physiological asymmetry ought to be the certain and rarely absent symptom of true idiopathic epilepsy. If this statement is justified, the problem of the diagnosis of epilepsy independent of the fit would be solved. But so far I have found nothing at all about it in literature except one adverse criticism by Jellinek (21). I fear in this method the prophecy of Benedict will come true, that the *cranoskop* will prove such a recognized diagnostic specific as the dousing-rod is in its way.

Special study has been given by Schüler (34) to the bony modifi-

cations of the cranium perceptible by Röntgen-rays and the outwardly recognizable asymmetry and signs of injuries, whose diagnostic importance is confirmed also by Schultze (33) and Quensel (51). According to di Gaspero (32) there very often exists in epileptics a leukocytosis even in the interparoxysmal period.

Redlich (40) calls attention to the importance of Babinski's phenomenon and of the reflex asymmetry, which are, when present, pathognomonic.

We have seen that the interparoxysmal symptomatology of epilepsy is very poor, though the authors who are in the habit of treating large numbers of epileptics almost all agree with Sarbó (3) that the epileptic is ill in his interparoxysmal periods too.

This study is not intended to be a general review of epilepsy. I have therefore not aimed at literary completeness; I only wish to review the various methods.

If we consider the above-enumerated diagnostic factors, we must state that, leaving out of consideration the sole cephalometric method (which is *ab initio* improbable and is so far supported by no one, but only opposed) there is no method which enables us to make the diagnosis in all cases independently of the fit. Under these circumstances, we must recognize the justification of a method which saves us in some cases both from watching for an attack and from the necessity of artificial provocation of seizures. This method can in some cases—as will be shown in the sequel—decide the question of differential diagnosis between epilepsy and hysteria.

I began to elaborate my method during the war, owing to necessity. I was for nearly two years the neurologist at the military hospital in Mostar. This hospital—with 100 to 120 beds for nerve disorders—had the first and greatest medical board for a part of Albania, Montenegro, Dalmatia, and Hercegovina. If we realize that in this fortress there were three or four general staffs and one or two tribunals, and that among the people of this South Slav part of our late monarchy (especially of Dalmatia) the most prevalent disease was the so-called “*padavica*” (a convulsive disorder, which was sometimes epilepsy but in most cases convulsive hysteria) we understand that the forty-two days' surveillance of every person suspected of epilepsy—prescribed by army regulations—was very difficult to carry out in the hospital and required special measures.

Working there for some months I had the curious experience that some of my patients, a part of those who were proved by further observation to be true epileptics, showed such an asymmetry to

Weber's tactile sensibility² as I had not seen except in patients suffering from organic nerve disorder.

Reflecting on the above-mentioned results I wrongly concluded from the fact that I had never heard or read about asymmetry of tactile sensibility, that physiological symmetry was an accepted fact. But after the war, when I wished to give an account of my experiences, I failed to find, in spite of earnest inquiry, either statistical data or even any kind of *a priori* statement of the normal course of the symmetry of tactile sensibility.³ I was therefore obliged to delay the publication of my experiences until I had examined, in connection with 918 persons of ten to thirty years of age, of both sexes, the normal distribution of the symmetry of Weber's tactile sensibility (54).

I do not wish to repeat myself, but in order to render these pathological assertions utilizable I may be allowed to cite from my physiological work the experimental method—which corresponds entirely with the method used in the pathological examinations—and the principles of the statements both of the trustworthiness—which measures the value of the reactions—and of the absolute and probable precision of Weber's sensibility; further the limit of asymmetry which may be taken as normal. I must, however, state at once that normality does not postulate complete symmetry.

I have experimented with Spearman's esthesiometer. Before the real examination I have always conducted experiments, for the sake of practice, on the volar surface of the top phalanx of the patient's little finger, allowing him to see the experiment. The following instruction was always given him: "Pay great attention! I am going to touch your finger with this instrument (I show it to the patient) and you must answer immediately after the touch, whether I touched you with both points (I open the instrument), or only with one point of the instrument (I completely close the instrument)."

The real examination took place, with the eyes of the examined person covered, on the volar surface of the top phalanx of his index

² I have examined Weber's tactile sensibility in all patients suspected of having organic disturbance of the brain, Ranschburg having stated (59) that asymmetry of this sensibility may possibly be the only sign of a focus in the brain.

³ Only after I had finished and described my examinations did the preliminary communication of Ganz (49) appear. This referred to the equality of the discriminative aptitude of both hands. Only after the appearance and careful study of his definite work will it be possible to consider what importance can be attached to the statements of Ganz, which are opposed not only to my statements, but also to his own anatomical cerebral examinations.

Some weeks ago I learned also that Griesbach (53) had in 1910 discovered that Weber's tactile circles of both sides are in healthy and nonexhausted persons equal or not very different. I regret that I did not know this paper before my study (54) appeared.

finger, first of the right and then immediately of the left hand, always with two points. The order of the distances between the two points was always the same, viz.: 1, 4, 3, 2, 3, 1, 4, 2, 2, 1, 1, 3, 4, 2, 3, 4 mm. The duration of the touch was 1 to 1.5 seconds. Before introducing the stimuli I gained his attention by saying the word "now," and laid the points of the instrument invariably parallel to the longitudinal axis of the finger.

I judged of the trustworthiness of the responses by the absence of contradictions, or rather of the untrustworthiness by the number of contradictions. For the basis of the method of numerically judging the contradictions, see Chapter V of my paper (54); I will not say more here than that I have taken as one contradiction a negative reaction following a positive one, received as the result of stimuli at the same distance on the same finger; and also every negative reaction, resulting from stimuli at distances of 1, 2, 3 mm. greater than the preceding positive, as 2, 3, or 4 contradictions. For instance a person correctly feels the two points at a distance of 2 mm. and has therefore a positive reaction at 2 mm.; if later in the examination he says he feels only one point from the same stimuli at a distance of 2 mm., I call it for each time one contradiction; if he feels later from the same stimuli at a distance of 3 mm. only one point, I note it for two contradictions, etc., etc. The absolute value of Weber's sensibility is gauged by the number of positive reactions; Da. (= the absolute asymmetry) is judged by the difference in the numbers obtained on the left and right hands. Conversely, the judging of the probable value and Dp. = its asymmetry is based on the examined person's discriminating limit counted in mm. In order to judge this probable value we consider the matter not only numerically but logically. In practice, if the stimulus at a certain distance causes at least three positive or three negative reactions, we take the distance as being respectively above or below the discriminating limit. In the case of an equal number of positive and negative reactions, we take the distance above or below the discriminating limit according to the positions of the positive reactions. For instance:

— — + + }	
+ — — + }	lines as positive or superliminal, and
— + — + }	
+ + — — }	
— + + — }	lines as negative or subliminal.
+ — + — }	

Normally, Weber's sensibility may be exactly symmetric, but between narrow limits it may be asymmetric too. The limit of the

normal asymmetry is affected by the age and sex of the person examined and the reliability of his answers. These limits, based upon age, sex and reliability are to be found in Tables XV and XVI of my paper (54). From a practical point of view one can neglect the age and the sex, and judging from my experiences on sound people as well as on sick persons, we ought to consider it a certain sign of organic nerve disorder or idiopathic epilepsy if:

- I. With 1 C. or none the Da. is 2, or more than 2.
- II. With 2 C. the Da. is 3, or more than 3.
We must consider it a probable sign of organic nerve disorder or idiopathic epilepsy, if:
- III. With 3 to 5 C. the Da. is 4, or more than 4.
But it is also a certain sign of organic nerve disorder or idiopathic epilepsy, if:
- IV. With 0 C. the Dp. is 1, or greater than 1.
- V. With 1 to 5 C. the Dp. is 2, or greater than 2.⁴

My experiments on sound people already published (54) as well as on sick ones, show perfect agreement, as asymmetry, which overflows the bounds of normality found in sound persons, has never been found in persons suffering from a functional disease but only in those suffering from organic nerve disorder or idiopathic epilepsy.

Most of the notes of my researches in Mostar, which were the basis of my pathological material, were lost in the Revolution. Thus my actual study is based on 17 hospital forms accidentally recovered from the military hospital in Mostar, on 16 forms from my private patients and 30 from my civil hospital patients at Budapest; further, on examinations made in Prof. Ranschburg's out-patient department for nerve disorders (2 patients), in Dr. Balassa's out-patient department (2 patients), in the lunatic asylum in Budapest directed by Dr. Epstein (3 patients) and in Prof. Sarbó's hospital department (81 patients).

Of these patients I employed the 81 cases of Prof. Sarbó for additional proof, examining only Weber's tactile sensibility; these persons were suffering from widely varying nerve disorder, I took them haphazard knowing neither the patients nor their diagnoses and examined only their tactile sensibility. After finishing the examinations, I arranged the results, according to the degree of definiteness of my symptom, into three groups:

In Group I.—Those who showed the symptom positively, *i.e.*, those whom my symptom showed to be suffering from organic nerve disorder or idiopathic epilepsy.

⁴ C. = contradiction; Da. = absolute difference; Dp. = probable difference.

In Group II.—Those who showed that form of the phenomenon which makes an organic nerve disorder or genuine epilepsy probable.

In Group III.—The others in whom my phenomenon was negative.

When I compared these groups with the clinical notes it was seen that none of the first group and a very small percentage of the second had a diagnosis of a functional disease. Among 151 patients examined the numerical details are as follows:

Chorea.....	1
Sclerosis multiplex.....	5
Encephalitis letharg.....	4
Enceph. leth.....	1
Stat. postenceph.....	3
Lues cerebrospinalis.....	14
Paralysis progr.....	9
Paralys. progr.....	8
Taboparalysis.....	1
Arteriosclerosis cerebri.....	1
Laesio corticalis.....	3
Haematoma epidur.....	1
Epilepsia corticalis.....	18
Epil. cort. traum.....	16
Epil. cort.luet.....	1
Epil. cort. e lue cong.....	1
Epilepsia genuina.....	21
Epil. gen. simpl.....	15
Epil. gen. c. psychos.....	3
Epil. gen. c. aequival.....	1
Epil. gen. cum lue.....	1
Epil. gen. c. alk. chron.....	1
Eclampsia.....	1
Alcoholism. chron. c. convuls.....	1
Alcohol. chron. simpl.....	1
CO intoxicatio.....	1
Migraine.....	1
Tetania.....	2
Cachexia strumipriva.....	1
Climacterium artef.....	1
Morbus Basedowi.....	1
Vagotonia.....	1
Tumor med. spin.....	2
Spondylitis.....	2
Myelitis transversa.....	1
Paralysis spin. spastica.....	1
Poliomyelitis chron.....	1
Syringomyelia.....	2
Syringomyelia.....	1
Syringomyel. c. lue.....	1
Tabes dorsalis.....	6
Paranoia.....	2
Dementia praecox.....	2
Neurasthenia.....	8
Neurast. simpl.....	3
Neurast. secund.....	5
Hysteria.....	36
Hyst. c. convuls.....	21
Hyst. simpl.....	15

The grouping of these diseases was not made from an etiological point of view, as I have preferred to arrange the material from a

"localizational" standpoint. In this way it is more clearly shown that this material, including a big percentage of functional diseases (35.7 per cent), is well suited to confirm the experimental results secured in 918 sound persons, *i.e.*, that my symptom proves in four of the above cases and makes probable in one case an organic nerve disorder or idiopathic epilepsy.

The diseases are grouped according to their symptoms as follows:

- In I. [Where the $C=0$ or 1, and $Da. \geq 2$]:
- | | | |
|------------------------------------|---|------------------------------|
| 4 <i>idiop. epil.</i> | } | 6 <i>idiopathic epilepsy</i> |
| 1 <i>idiop. epil. c. psychosi</i> | | |
| 1 <i>idiop. epil. c. aequival.</i> | | |
| 1 <i>cort. epil.</i> | | |
| 1 <i>cort. epil. ex lue acqu.</i> | } | 3 Jacksonian epilepsy |
| 1 <i>cort. epil. ex lue cong.</i> | | |
| 3 <i>lues cerebri</i> | | |
| 1 <i>taboparalysis</i> | | |
| 1 <i>encephalitis leth.</i> | | |
| 2 <i>tabes</i> | | |
| 1 <i>syringomyelia c. lue</i> | | |
| 1 <i>spondylitis</i> | | |
- In II. [Where $C=2$, and $Da. \geq 3$]:
- | | |
|-------------------------------|--|
| 4 <i>idiopth. epilepsy</i> | |
| 3 Jacksonian epilepsy | |
| 1 <i>lues cerebrospinalis</i> | |
- In III. [Where $C=3$ to 5, and $Da. \geq 4$]:
- | | |
|--|--|
| 1 <i>idiopathic epilepsy</i> | |
| 2 Jacksonian epilepsy | |
| 1 <i>laesio corticalis</i> | |
| 1 <i>haematoma epiduralis</i> | |
| 1 <i>lues cerebrospin.</i> | |
| 1 <i>sclerosis multipl.</i> | |
| 1 <i>neurasthenia sexualis</i> [11.1 per cent] | |
- In IV. [Where $C=0$ and $Dp. \geq 1$]:
- | | |
|---|--|
| 1 <i>idiopath. epilepsy cum psychosi</i> | |
| 2 Jacksonian epilepsy ex lue | |
| 1 <i>lues cerebrospinalis</i> | |
| 1 <i>alkoholismus chron. cum convulsionibus</i> | |
- In V. [Where $C=1$ to 5 and $Dp. \geq 2$]:
- | | |
|------------------------------|--|
| 2 <i>idiopathic epilepsy</i> | |
| 3 Jacksonian epilepsy | |
| 1 <i>sclerosis multiplex</i> | |

From a consideration of the above table the following general deductions may be made, *viz.*, that all patients were suffering from idiopathic epilepsy or from an organic nerve disorder, who had:

- 0 or 1 C. in case of 2 or more than 2 Da.,
- 2 C. in case of 3 or more than 3 Da.,
- and also those who had:
- 0 C. in case of 1 or more than 1 Dp.,
- 1 to 5 C. in case of 2 or more than 2 Dp.,
- and 88 per cent of those who had:
- 3 to 5 C. in case of 4 or more than 4 Da.

This table emphasizes the fact that in the case of paroxysm, when it is uncertain whether it is epilepsy or hysteria, and organic nerve

disorder is excluded, my symptom is definite proof, in its first, second, fourth and fifth forms, and approximate proof (88 per cent) in its third form of idiopathic epilepsy. Thus by its positive form the method diminishes the number of cases where, without it, the diagnosis would be inseparable from the observation of a paroxysm.

The method offered here does not require more than 2 or 3 minutes; it is therefore beyond all doubt more suitable and quicker than observation, which often takes several weeks or months (loss of time in epilepsy or hysteria is by no means unimportant). There is also less risk of accident both for the patient and for the physician than with the artificial provocation of a fit, which moreover may injure the patient and can be used as a pretext, especially by hysterical individuals, for a claim for damages. In addition to this, its evidence is disputable.

I wish again to call attention to the fact that the loss of my notes in the Revolution has forced me to restrict my numerical proofs to these 150 cases, while in fact my observations deal with more than 1,000 patients of whom 75 per cent were epileptic or suffering from organic paroxysmal disorders. The percentage of those who showed my symptom in positive form is 31.5 per cent in 19 epileptics. This percentage seems to me more favorable than I expected after my experiences in Mostar. It is very probable that the percentage found in Mostar, which I think was approximately 25 per cent, is lower, because, as is well known, there are in a military hospital more fresh cases than in civil hospitals, which fact largely affects the result.

It is very difficult to judge both the pathologic and the eugenic importance of this symptom. At first it seemed to me very plausible that the cases which showed my symptom were distinguished, *ipso facto*, from idiopathic epilepsy and might be considered as cases of symptomatic or cortical epilepsy. But I soon noticed that this symptom has not always the same significance and its origin can be *a priori* explained in three ways:

1. It may be the sole symptom of cortical epilepsy occasioned by a focus in the cortex.
2. It may be a manifestation of an asymmetrical development of the cerebrum which might be the constitutional condition of idiopathic epilepsy itself.
3. It may be the symptom of a secondary change in the cortex, caused by those physiological changes which are associated in idiopathic epilepsy with the mechanism of convulsions and become settled after some recurrences of attacks.

In No. 1 where the above mentioned asymmetry of the tactile sensation would be the sole interparoxysmal symptom of a focus in

the cortex, the case would be excluded from idiopathic epilepsy and would be fixed among the symptomatic cases; this finding may have a very great influence not only on therapeutics but also and especially on eugenics. I regret that I cannot yet give a criterion, from which in a given case conclusions may be drawn regarding the genesis of my phenomenon. In any case, if my symptom is positive at the very beginning of the disease, it would be a probable indication that the focal change in the cortex is not a secondary one, but the cause of the paroxysmal symptoms; though it would be possible even in this case to encounter a complication somewhat similar to Lichen's (24) analogical case, or to find an hereditary abnormality of the cerebrum as mentioned in No. 2 above. We must take this possibility into greater account, because both ancient and recent authors have repeatedly pointed out the frequent coexistence of genuine epilepsy and one-side phenomena. Thus Uyematsu (45) found in an epileptic the total lack of the bulbus olfactorius with the imperfect development of the smelling area, both in the right side; Stern-Piper (42) reported that in infantilismus as well as in other psychical and neurological inferiorities, especially in epilepsy, he has often seen a one-side modification of the reflexes in the abdominal region, of a type of congenital defect. Even Knapp (48) often observed—although he secured his statistics only those epileptics who, owing to their anamnesis, decursus, biopsy, autopsy and histological examination, were free from an organic nerve disorder—that repeated convulsive attacks were more pronounced in one, invariably the same, side. Benedek has found that the normal plantarreflex, being in abeyance during the fit, often fails to return at the same time in both sides. This experience of Benedek would have confirmed Knapp's results, if among the epileptics examined by Benedek there had not been cases complicated by syphilis and injury to the skull. There must be a connection in some way or other between asymmetric development and epilepsy, as any one may very often find in epileptic families both hemicrany and lefthandedness. Thus Heilig and Steiner (8) have examined 294 families that contained one or more left-handed members, and found epilepsy in 41 per cent, while at the same time, they did not find a single epileptic in 294 entirely right-handed families. Schultze (33), Gauter (35), Gött and Wildbrett (50) have confirmed this conclusion, inasmuch as they have found that children of left-handed families are especially disposed to convulsions. On the other hand Bardeleben (14) does not think that left-handedness is a sign of neuropathic heredity and gives it as his opinion that one becomes right-handed only through education. Ballard's researches (12) point in the same direction. In connection with the

frequent coexistence in some families of left-handedness and epilepsy Redlich (5) supposes the cause of left-handedness as well as of epilepsy to be a mild and unnoticed attack of encephalitis in very early childhood. Steiner (6) has denied this, although he cannot disprove it. Redlich (4) states that in more than 40 per cent of cases observed by him there was a hemiparesis and in addition, he noticed in 45 epileptic women out of 100 that the tactile sensibility was developed better in the left hand than in the right; also he even found (10) one-side Babinski phenomenon, and, often enough, some differences between the superficial reflexes after the fit. Esquirol and Jellinek (both cited in 47) and in agreement with them Benedek (47) considers one-side convulsions to be very frequent and very typical manifestations of epilepsy.

In this present paper I will not discuss the question whether all epilepsy is primarily caused by a cerebral focus or not, although with Binswanger (11), Moravcsik (7), Kraepelin (13) and others I contend that there is an idiopathic epilepsy which has no causative anatomical substratum in the brain. I will not discuss the question, because the experiments described above were not conducted for that purpose. However my material, little as there is of it, will be found sufficient to prove that the cortical focus, whose intransitive manifestation, the asymmetry of the tactile sensibility of some epileptics, is in many cases not the cause but the consequence of the seizures. Thus:

25 per cent of epileptics having had the disease for less than 1 year
33.3 per cent of epileptics having had the disease for less than 5 years
66.6 per cent of epileptics having had the disease for more than 5 years
show the above described symptom in positive form.

This increase of positive cases can scarcely be otherwise explained than by the fact that the number of cases reacting positively, owing to a causative focus in the brain, was increased by those epileptics in whose organism periodic fits developed the change which served for the anatomical basis of my symptom.

The hypothesis that repeated occurrences of convulsions may lead to some change in the brain, to an alteration first of transitory but sooner or later of permanent character, which exhibits itself in a definite and asymmetric decrease of the tactile sensibility, is supported by Griesbach's observation (1 and 38). This author's opinion—based partly upon his personal experience—is that physical work has a debilitating influence upon the tactile sensibility and that by physical exhaustion Weber's tactile circles in the left side are always bigger than those in the right.

The possibility of a secondary cortical focus and one-side symp-

toms being caused by the recurrence of attacks, is realized by Redlich (10), Binswanger (9) and Bolten (20).

Reviewing the above, I contend that no further proof is needed that my symptom:

1. Eugenically has no significance except in fresh cases, though in these it is very important, as it diminishes the probability of the hereditary nature of the disease.

2. From the point of view of pathology, proves the possibility of a cerebral focus as the result of frequently recurring fits, and further of the coexistence of such a focus with idiopathic epilepsy.

3. From the point of view of the diagnosis in 25 to 30 per cent of epileptics it gives a rapid diagnosis without observation and without the provocation of a fit.

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FLEXION PARALYSIS OF SPINAL AND CEREBRAL ORIGIN *¹

BY ALFRED GORDON, M.D.

Paralysis of the extremities in a position of flexion instead of extension has been observed sporadically by various writers since 1837 (See Ollivier's *Traité des maladies de la moelle*, p. 431), but none gave the phenomenon its due attention as much as Babinski. In 1911 he collected all his observations on this subject and presented the following symptom-group: flexion of the lower extremities caused by contractures, increase of the defense reflex, absence of exaggeration of the knee-jerks or else their total abolition, and anatomically an integrity of the pyramidal tract.

A brief analysis of the individual manifestations of this syndrome may be warranted. The "defense reflex" consists of retraction movements which can be brought out by stimulating the skin of the dorsum of the foot: the foot promptly enters into a dorsal flexion, the leg flexes over the thigh, and the thigh over the pelvis. Relaxation and return to the original position follow. Contraction and relaxation are done differently in normal and pathological conditions. In the former they are carried out rapidly, in the latter slowly. This reflex may extend even to the fellow limb of the opposite side or to any other extremity, to the muscles of the trunk and of viscera. It is frequently observed in cases in which there are no increased tendon reflexes, especially in diffuse cord lesions such as compression, Friedreich's ataxia, multiple sclerosis. It may coincide with absence of degeneration of the pyramidal pathway. In brain lesions exaggeration of the "defense reflex" is especially evident in the initial phases when cerebral inhibition is most pronounced. Intensification of this reflex in all the extremities and its extension to other parts of the body are always an indication of grave and diffuse lesions, especially in cases of invasion of the ventricles, and in meningeal hemorrhages. The reflex is the result of a release in the elementary mechanisms concerned in the activity of the spinal cord which activity becomes exaggerated and misdirected by the underlying pathological process.

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The original cases of flexion paralysis as described by Babinski and by some of his followers have reference to instances of compression of the spinal cord. Lately some writers upon the initiative of Pierre Marie and Foix (*Revue Neurol.*, 1920, No. 1, p. 1) observed precisely the same phenomena in organic diseases of cerebral origin, so that at present *flexion paralysis* can be considered as a classical clinical type. It has its diagnostic value in diseases of the spinal cord, since it has been found mostly in cases of compression; it has its physiological importance as it points strongly to the possi-



FIGURE I. Seventh Cervical Segment, showing tumor, thickened meninges and disfigurement of the cord tissue.

bility of its being the expression of an exaggerated defense reflex thus indicating and suggesting the existence of spinal automatism.

In the present contribution in addition to an example of spinal compression similar to Babinski's cases the writer wishes to place on record also instances of flexion paralysis in cerebral lesions with a special emphasis on the unilaterality of the affection.

Case I. M. F., male, aged forty-eight, sustained an injury to the back following a collision of trains. He commenced to complain of pain in the back radiating anteriorly about six weeks before he first consulted me. The right side caused more suffering than the left. The pain was "stabbing,"

to use his own expression. It was worse at night and became aggravated on coughing or on the slightest movement. He had to go to bed. The pain would shoot up and down the spine, spread around the thorax. A sitting posture was impossible. He had to lie flat on the back. At the time of the examination he presented the following clinical picture: The lower limbs are totally paralyzed and the paralysis is flexor in type; there is a very slight rigidity. The patellar tendon reflexes are preserved but much diminished on the right. There is no ankle-clonus on either side. Babinski, Oppenheim, Chadwick, Gordon are absent on the right and doubtful on the left. The cremasteric and abdominal reflexes are lost on both sides.

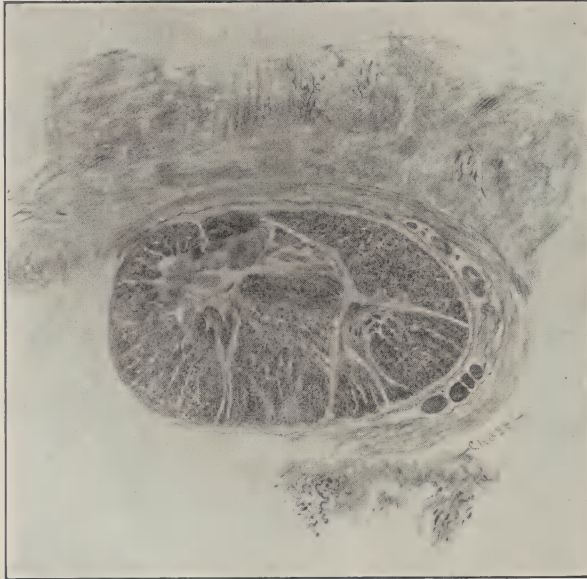


FIGURE II. Cervical Segment, showing the same as Figure I.

Sensations. Touch is preserved, but pain and temperature senses are abolished from the ankles up to two fingerbreadths above the umbilicus and greatly diminished over the feet. Above the upper limit of the anesthesia there is a zone of the dimension of two fingerbreadths of hypalgesia and thermohypesthesia and above the latter normal sensibility commences. The thorax and upper extremities are normal with regard to coördination, motility, reflexes and sensations. The cranial nerves are all normal. The sphincters are paralyzed. The patient keeps on complaining continuously of pain at the level of the lower ribs radiating from the spine along the intercostal spaces towards the sternum. He also observed that very frequently there would be involuntary contractions of the muscles of the lower limbs drawing up the thighs towards the pelvis thus accentuating the already existing flexion contracture of the legs. A lumbar puncture brought out a slightly turbid fluid with 14 cells per c.c., of which the polymorphonuclei showed 40 per cent, the mononuclear 60 per cent. Xanthochromia was

present. There was 2 plus of albumen and the spinal fluid after standing coagulated. The Wassermann was negative. The blood was negative as to Wassermann, hemoglobin content and its cytology. A puncture of the cisterna magna brought out the spinal fluid under a considerably greater pressure than upon lumbar puncture. An x-ray examination of the spine showed no abnormalities, but the x-rayed thoracic cavity showed a large dense shadow starting in the mediastinum on the right side and tapering outward, extending between the fourth and sixth ribs. The paraplegia, the sensory disturbances, involvement of the sphincters, the state of the cerebro-spinal fluid—all spoke in favor of an obstruction at the level in the upper thoracic segment of the cord. The further course of the disease showed a continuous aggravation of the morbid manifestations. All reflexes, cutaneous and tendinous, which were present upon the first examination have now completely disappeared. A laminectomy between the third and sixth dorsal



FIGURE III. Mid-Dorsal Segment. Note the absence of pyramidal degeneration.

vertebrae revealed very thickened tissue. At that moment the patient's condition became alarming and the operation had to be interrupted. A few days later the patient died.

Necropsy revealed the following condition: The posterior portion of the right lung and pleura was adherent to the spinal column. At the level of the fourth dorsal vertebra a difficulty was encountered in freeing the lung from the spine. When this was done, an abscess cavity was found with marked induration around it. The wall of the cavity is made up of a necrotic structure and surrounding the larger bronchi. The adjacent portion of the left lung also shows a beginning necrosis. The heart, liver, spleen, and kidneys all show congestion, enlargement and some fatty infiltration. The bodies of the fourth and fifth vertebrae were much thickened and friable showing disintegration. At this level the spinal cord was found adherent to the canal and surrounded by a thickened mass; the rest of the cord was free in the spinal canal.

A histological study of the spinal cord gave the following picture: the third lumbar segment: one half of the section appears to be slightly paler

than the other half, but it is probably due to faulty technique (discoloration of the stain was evidently greater on one side). No distinct degeneration of the pyramidal tract is seen. Twelfth dorsal segment: there is no evidence of degeneration. Upper dorsal: the disfigurement of this segment is extensive. The tissue was found to be very soft and it required considerable time (several months) to obtain some degree of hardening for staining purposes. The sections show displacement and destruction of the largest portion of the gray matter. Areas of degeneration are seen almost in every column; they are very irregular. The cord is surrounded by thickened

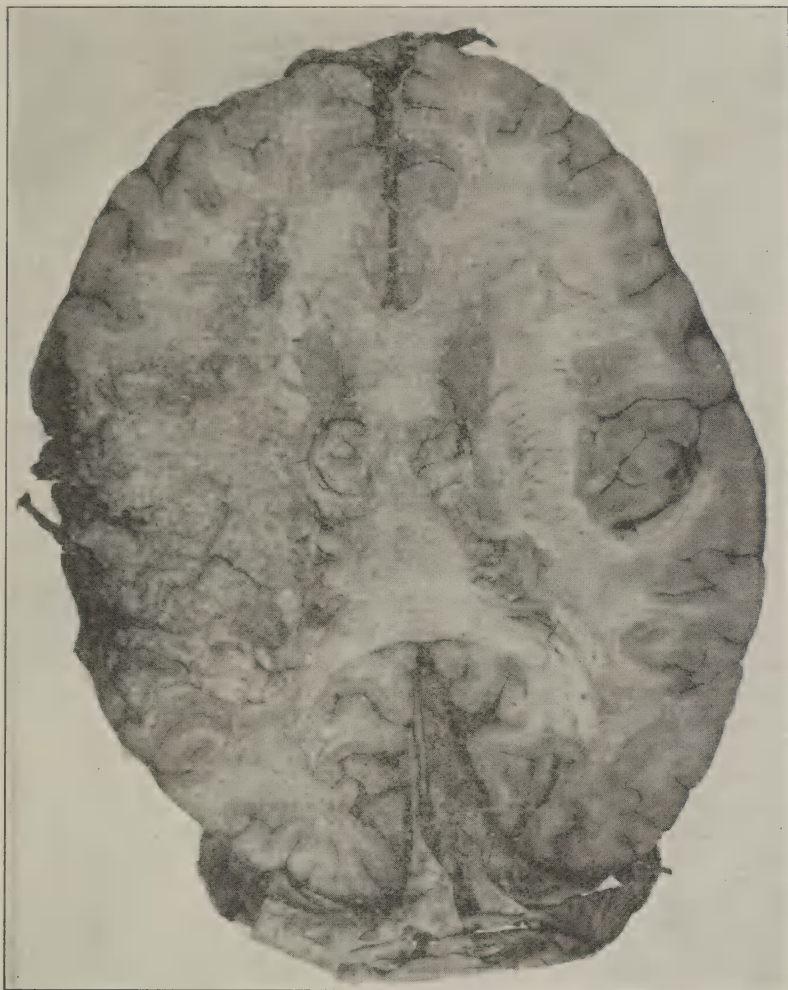


FIGURE IV. Lumbar Segment. Note the absence of pyramidal degeneration.

meninges which in their turn are surrounded (mostly anteriorly) by a very thick and dense mass apparently of a fibromatous structure. The blood vessels as well as the nervous tissue are involved. The myelomalacia extends upwards to the *lower cervical* segment which also shows considerable destruction and displacement of its various portions, gray as well as white. It is also surrounded by the fibrous growth mostly anteriorly.

The *Diagnosis* therefore in this case is: Compression of the spinal cord at a space between the lower cervical and fifth thoracic segments produced by a tumor (fibromatous) extending from the pleuro-pulmonary level to the spine involving the bodies of the fourth and fifth dorsal vertebrae and secondarily the cord and its meninges in its upper portion.

Case II. L. G., female, forty-three years of age, complained of headache, dimness of vision and vomiting for several weeks. Her previous medical history shows only two abdominal operations seven years ago, the nature of which could not be ascertained. Upon examination it was noticed



CASE II. Gliomatous infiltration. Destruction of extrapyramidal system.

that there was a paretic condition of her left arm and of the lower part of the face on the left side. A few days later the left leg became also involved and was found in a flexed position. The left knee-jerk could not be obtained even on reinforcement, but the right was normal. Babinski was at times positive and at times negative on the left but no response could be obtained on the right. All other methods were used to elicit the left plantar reflex,

but they all proved to be negative. There was no ankle-clonus on either side. Tests for superficial sensations showed considerable diminution of pain on the entire left side of the body. A detailed examination for deep sensibilities could not be made because of the involvement of the patient's mentality; she was somewhat stuporous and sluggish in replying to questions. The first examination of the eyes showed a very large hemorrhage in the right eye covering the entire macular region, the nerve was swollen. The left eye had a small hemorrhage, but there were no changes in the nerve head. A lumbar puncture brought out under high pressure 15 c.c. of spinal fluid with 14 cells; all tests of it proved to be negative.

The patient's condition gradually grew worse. The palsy became more pronounced. Rigidity appeared in the left arm and leg and the flexion of the leg became more marked. The least pressure or pinching of the skin of that leg produced an unusual contraction of the thigh against the pelvis, of the leg against the thigh but always in flexion, and of the foot dorsally against the leg (defense reflex). The patellar tendon reflex was still unobtainable in the left leg and there was no Babinski on the left. The diagnosis was made at that time of a neoplasm in the right hemisphere involving the right parieto-occipital region. A decompression of that area revealed that the brain was under considerable pressure, the overlying vessels appeared engorged. The patient's condition after the operation grew worse. The retinal hemorrhage appeared unusually large in the right eye on the temporal side; but there was some improvement in the papilloedema. The stuporous state was noticeably deeper and deeper, and the flexor contracture with the absent tendon and cutaneous reflexes remained unaltered. Oedema of the lungs made its appearance and the patient soon expired.

Necropsy revealed an infiltrating gliomatous mass on the right side affecting the entire parietal region also partly the occipital area, destroying the thalamus, the corpus striatum and all the structures close to the median line. There was also partly a forward invasion towards the frontal lobe. No degeneration of the pyramidal tract could be seen.

Case III. Ch. T., colored, forty-two years of age, developed muscular twitchings in the left arm. They became accentuated upon voluntary acts and were markedly evident in finger-to-nose movements. The grip of the left hand was much weaker than that of the right. The tendon reflexes of the left arm were absent. The knee-jerks were not always obtainable on both sides, but at times the right knee-jerk would be present although markedly diminished. The plantar reflex was extensor on the right by several methods (Babinski, Oppenheim, Chadwick, and Gordon). On the left there would be no response upon stimulation. The left lower face was distinctly deviated to the right. Astereognosis was present in the left hand, the pain sense was diminished but touch and temperature senses were preserved over the entire left arm. Deep sensibilities were also involved in the same extremity. The patient had subsequently several convulsive attacks with loss of consciousness. In each the spasms were confined exclusively to the left arm and the head was turned to the left side. In the last of the convulsive movements, which were unusually severe, a total paralysis developed in the left arm and the leg. In two days it was observed that the palsied leg commenced to become rigid and flexed. Although with an effort the

patient succeeded in extending the leg, nevertheless it would involuntarily return to the flexed position. The defense reflex was particularly exaggerated in the left leg: upon the least touch of its cutaneous surface at any level the three segments of it would very promptly be drawn upwards. The left knee-jerk was still absent, there was no ankle-clonus and the toes would remain indifferent to various tests for the plantar reflex.

The eye examination showed a limitation of the ocular movements to the left and a left-sided hemianopsia. The Wassermann reaction of the blood and spinal fluid was negative.

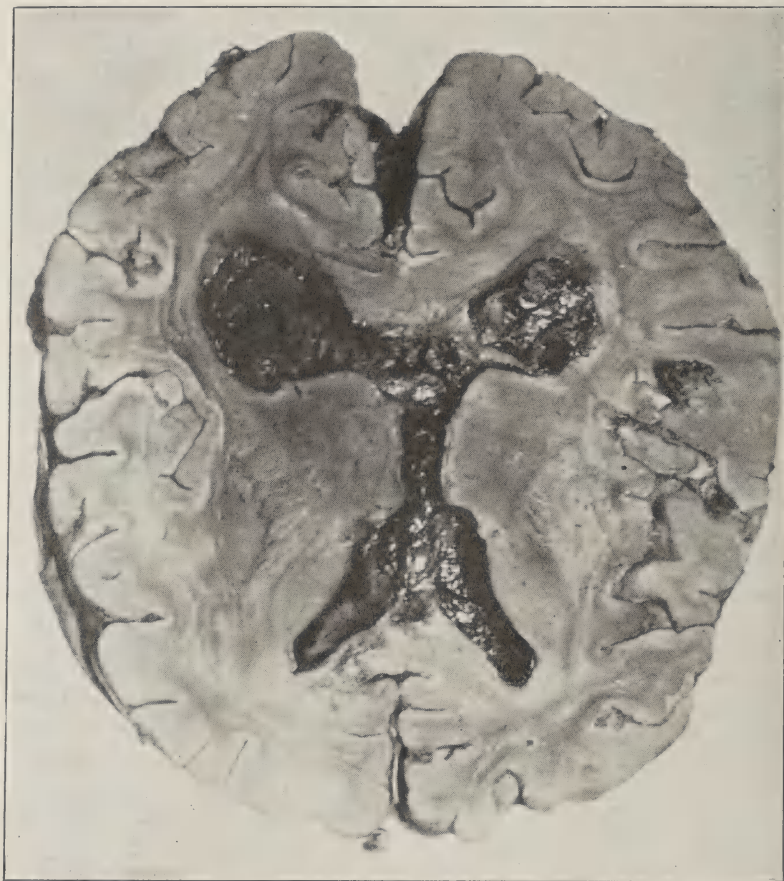
The patient's condition remained unaltered for two more months except that the flexor contracture of the left lower limb became more pronounced. Three days before the patient died there was a sudden rise of nocturnal temperature to 103.3 F. The convulsions became very frequent and in one of the seizures death ensued. At autopsy the abdominal and thoracic viscera



CASE III. Ependyma of anterior cornu of lateral ventricles. It is thickened and covered with nodules of various sizes and forms. Cellular infiltration in nodules and in enlarged blood vessels.

were found normal. The brain presented unusual findings confined exclusively to the lateral ventricles. The lesion was pronounced on the right side and only slightly evident on the left side. There was an unusually large quantity of fluid in both ventricles, which were both dilated. The external walls considerably reduced the subcortical tissue at the level of the upper portion of the fronto-parietal region much more on the right side than on the left. The white matter in that region was strikingly pale. The ependyma had lost its uniform smoothness and was covered by numberless miliary nodules. The latter presented cells of partly necrotic material, some of them under the ependyma, some had destroyed it, and some were on its surface. Their relative size was not equal, some of them were very close to the surface, others were loosely attached to the surface, and formed thick branches at a certain distance from the surface. They consisted of crowded round cells which followed the branches of original nodules. In the vicinity many vessels had mononuclear cells similar to those of the nodules. Some blood vessels were thrombotic and very much dilated, and had thickened walls. In the latter the inner layer was shriveled and torn in some places. The ependyma itself immediately beneath the miliary nodules was much thickened and it was covered thickly between the nodules by round cells. In some areas there was solution of continuity of the ependyma which solution continued deep in the subependymal tissue. The inner walls of the

separated portions were covered with round cells. The nodules were of the character of miliary gummata. The white substance beneath the ependyma was gravely destroyed or softened, in some areas it was in a state of recent degeneration as shown by the Marchi method. Some fibers showed great irregularity along their course. The small arterioles in the same areas presented dilatation, rarefaction, thickening of their walls with leucocytic infiltration. Immediately beneath the cortex the layer of tangential fibers



CASE IV. Extreme dilatation of lateral ventricles, especially on the right.

show a diminution in thickness. At the same level were also seen slight alterations in the cortical cells, namely, some disfigurement in shape, size and displacement of nuclei. The pyramidal tract showed no descending degeneration.

Case IV. C. D., male, forty-three years of age, complained of considerable headache and dimness of vision for a period of six months. At that time he observed a gradually oncoming awkwardness in the left arm and

leg which became more and more accentuated and in three weeks a complete hemiplegia was present. At first the paralysis was flaccid, but gradually it developed into spasticity. During the process of change from flaccidity into rigidity the patient observed that the left leg would no more remain in an extended position but little by little each segment of it became flexed. The tendon reflexes were markedly increased on the right side but very much diminished and at times not obtainable on the left side. The plantar reflex was extensor in type on both sides, more evident and prompt on the right than on the left side. The abdominal reflex was abolished on the left side but was slight on the right side. The defense reflex was unusually pronounced on the left side inasmuch as the least pinprick of the cutaneous surface over the entire body would strikingly produce a sudden contraction of every segment of the left lower limb thus increasing the already existing flexion. Sensations to all forms were grossly diminished over the entire surface of the left arm and leg.

For a period of six months the patient's condition remained unaltered. The headache was continuous but not severe. The eyes presented no abnormalities with the exception of a lateral nystagmus when the eyes turned to the right. Wassermann reaction was negative in the blood and spinal fluid. The peripheral blood vessels showed decided hardening and lack of compressibility. The systolic blood pressure was 185. The urine contained a large amount of albumen and many hyaline casts. The patient's mental condition commenced to fail: he became at first inattentive, would easily forget the most important occurrences. Soon his judgment became defective. He was childish in his reasoning and behavior. The function of the sphincters became defective: very frequently there was incontinence. He then developed attacks of vertigo followed by somnolence: suddenly he would scream out, place rapidly his hands on the woodwork of his bed holding on to it, firmly, saying the entire room is whirling. In a few seconds he would relax his hands and become drowsy, saying he was going to sleep. These attacks became more and more frequent and one night he was found dead and there was a great deal of blood at his mouth and nostrils.

Autopsy revealed a soft and large brain, a section of which presented a marked dilatation of the third and the lateral ventricles which were filled with blood. The dilatation was particularly pronounced in the posterior horn on the right side. It compressed the surrounding cerebral tissue destroying the lenticular nucleus and the posterior limb of the right internal capsule, thus reducing the adjacent subcortical tissue. Histological study of the descending tracts revealed with Marchi stain very slight degenerative areas irregularly distributed in both pyramidal tracts and only in the cerebral peduncles, but not at a lower level. Weigert's stain failed to reveal any microscopical changes at any level.

An analysis of these four anatomo-clinical cases demonstrates the existence of a special type of flexion paralysis not only in diseases of the spinal cord but also in those of the brain. The condition laid down originally by Babinski are found here almost in toto. I say "almost" because while on one hand exaggeration of the defense

reflex, diminution or abolition of the tendon reflexes were all present in association with flexion contraction, on the other hand there was no clear cut plantar reflex in flexion. The various tests for the latter gave in some of my cases no response at all. The first case is one of compression of the spinal cord, similar to the original Babinski's observation. We find here not only the complete clinical picture but also an anatomical verification of Babinski's claim concerning the pyramidal tract, namely, absence of degeneration.

Charcot was the first to call attention to paralysis in flexion in his lectures on Cerebral Localization (*Oeuvres complètes* t. IV. 13 leçon). Brissaud was the next observer: he described a case of an old hemiplegic woman whose paralysis gradually changed from the extensor to the flexor type. He attributed the condition to a spinal sclerosis. (*Thèse de Paris*, 1877, Obs. XIII.) In 1883 Demange described a case of bilateral hemiplegia with flexor contracture and he attributed the latter to striate-pyramidal lesions which he found at autopsy. This case was the first attempt to explain the symptom-group under discussion as due to a cerebral cause (*Revue de Médecine*, 1883). Since then Lhermitte observed the phenomenon in cases of lacunes in both cerebral hemispheres of aged people. A more elaborate study of the subject with anatomical proofs comes from the pen of P. Marie and Foix (*loc. cit.*). In their case the clinical syndrome with some exceptions was essentially complete and the anatomical substratum was a progressive subependymal necrosis.

Finally Alajouanine in a recent contribution on a case of cerebral sclerosis found anatomical evidences of destructive lesions in both hemispheres. As to the mesencephalon, medulla, and cord, the usual secondary degeneration of the pyramidal tracts were alone present. In this case the paraplegia gradually became flexor and before the latter had fully developed, the knee-jerks were present and increased, the plantar reflex was flexor in type. When, however, the flexion contracture became totally established, the knee-jerks disappeared, the plantar reflex became extensor, and the defense reflex became markedly increased in spite of the intensity of the flexor contracture. In comparing the records of Marie-Foix and of Alajouanine with the three cerebral cases reported here we find that in all the outstanding feature during life was the flexion paralysis: sometimes the flexed attitude of the limbs appear at the onset, sometimes it develops later in the course of the disease. In all the defense reflex is exaggerated but the tendon reflexes are either diminished or abolished. As to the plantar reflex, in some cases it is extensor throughout the disease (Marie-Foix), in others it is at first flexor and later

extensor (Alajouanine); finally in the cases reported here either there was no response at all to the usual tests or there was extension.

In comparing the flexion paralysis cases of spinal origin with those of cerebral origin we find in both the same Babinski's dissociation of reflexes, namely, increase of defense reflex and diminution or absence of tendon reflexes. As to the plantar reflex, in the spinal cases it may be totally absent alongside of other cutaneous reflexes. Anatomically the two kinds of cases show a difference. In Babinski's cases as well as in the spinal case reported here there is no evidence of degeneration of the pyramidal tract. In the cerebral cases the records vary: In Marie-Foix's case degeneration of the pyramidal tract commences only in the lumbar segment of the cord. In Alajouanine's case degeneration was present throughout the entire cerebro-spinal axis. In my series Case IV presented irregular degenerative areas of the pyramidal tracts limited to the cerebral peduncles.

In Case III no descending degeneration of the pyramidal tract was in evidence. In Case II the pyramidal tract was intact. With the exception of Alajouanine's case in which gross and microscopical changes were diffuse throughout the entire cerebrum, in all other cerebral cases degeneration of the pyramidal tract was either at a minimum or totally absent.

The flexion paralysis cases of cerebral origin described here present this peculiarity that the clinical symptom-group was present only on one side. The unilaterality of the syndrome must be a rare occurrence as no anatomical records could be found in the literature at my disposal, although in Alajouanine's case there was a considerable predominance of flexion contracture on one side. He also reports three purely clinical cases (without autopsies) in which he observed on the hemiplegic side the symptom-group under discussion. Very recently I observed in a child five months old an enormous hydrocephalus with a large left meningocele presenting flexion paralysis, loss of the knee-jerk and exaltation of the defense reflex,—all on the left side. Besides the unilaterality, the cases reported here differ from the other cases in that the symptom-group did not occur in aged individuals and that there was no question of diffuse cerebral sclerosis. My Case III presents a striking resemblance to Marie-Foix's case in that the lesion was confined to the lateral ventricle and the ependyma was diseased although in a different manner.

To sum up, the chief anatomical conditions in my three cerebral cases were: (1) A gliomatous mass which has destroyed in one hemisphere the subcortical tissue, the striate body and the surrounding structure; (2) a considerable dilatation of the lateral ventricles

which on one side destroyed a part of the striate body and the surrounding tissue: (3) an ependymitis and necrosis of the subjacent white fibers of the upper portion of the frontoparietal region. Clinically the entire picture in its essentials was present in all the three cerebral cases but confined to one side of the body. The other important feature in those unilateral cases was that the lesions were limited to the upper portions of the brain, the mid-brain remaining intact and in the spinal cord there was no primary lesion. There can be no doubt that in the three cerebral cases described here the unilateral paralysis is the consequence of the unilateral anatomical condition on the opposite side. While in the spinal cases there is only compression, here we are dealing with states of compression and destruction, so that if in the first the spinal automatism can be explained on the basis of cerebral interruption by reason of the existing compression,—in the cerebral cases a serious unilateral damage will have the same effect by reason of loss of unilateral cerebral influence. Here also we have spinal automatism either by release from inhibition or by stimulation of the cord below the cerebral lesion. However, how to explain here the character of the contracture, namely, the flexion, the diminution or absence of tendon reflexes on the affected side, the increase of the flexion contracture upon the least stimulation?

Commencing with Sherrington many experimental investigators in the field of decerebration have proven that the same physiological mechanism underlies the flexion, extension, crossed extension and "mark time" reflexes (Sherrington), namely, that they all represent phenomena of spinal automatism, similar to those which are observed in the decapitated frog. Whether the interruption of the cerebro-medullo-spinal continuity occurs in the spinal cord (as in cases of compression) or high up in the cerebrum above the mesencephalon, whether the interruption is bilateral or unilateral (as shown from the cases described above), the deduction which can be drawn from these cases is that the spinal automatism is created by pathological interruptions which physiologically speaking mean suppression of cerebral inhibition (bilateral or unilateral). In flexion paralysis (cerebral or spinal) the automatism of the lower centers is exaggerated not only in purely reflex movements, but also in volitional acts, so that in all such cases stimulation from without as well as an attempt on the part of the patient to perform an act with his affected limb will increase the flexion contracture.

If one reflects upon the character of the classical extension contraction in hemiplegia and compares it with the flexion contracture

under discussion, a fundamental difference is evident: the same stimulus will not produce an increase of extension contracture but will intensify the flexion contracture; the tendon reflexes are increased in the first, but greatly diminished in the second. Close observation will frequently reveal this fact that not rarely extension contracture after a certain period of time in the course of the disease will become replaced by flexion contracture and at the same time the patient's general condition becomes aggravated. This circumstance points strongly to a progressively deeper involvement of the cerebral tissue, and the existence of a flexion contracture at any period of a given affection is an indication of a more serious organic lesion. If we extend our differential analysis to the pathological findings, we observe that in cases of extension contractures the pyramidal tract is essentially involved: a descending degeneration is the rule. On the other hand in the cases of flexion contracture, which have so far come to autopsy, there is very slight or no degeneration at all in the pyramidal tract. The pathological findings in all the cases of flexion paralysis are all of unusual intensity. In Alajouanine's cases (*loc. cit.*) there were diffuse atheromatous changes and a large number of lacunes as a result of softening and disintegration in the cortex, in the white substance and in the opto-striate bodies. The caudate nucleus and the putamen were especially involved. In this particular case, there was great variability from time to time in the symptoms, especially in the reflexes, tendinous, and cutaneous, also in the defense reflex, but towards the end of the patient's life the above described characteristic features of the flexor contracture became definitely established. This explains the gross and minute lesions distributed in a diffuse manner found post-mortem. The outstanding pathological feature in this case is the intensity of the main lesion which was situated in the caudate nucleus and putamen. In Marie-Foix's case the ependyma and the subjacent tissue were particularly affected. The ventricles were much dilated so that the caudate nuclei were displaced towards the lowest portion of the lateral wall of the ventricles. The corpus callosum was unusually thin. Cellular changes were seen throughout the cortex.

In my series of cases reported above the lesions were extensive: in one case a glioma destroyed in one hemisphere not only the white matter but also the striate bodies; in another case the dilatation of one lateral ventricle was so extensive that it destroyed the lenticular nucleus; in still another case, which presents a great deal of resemblance to the Marie-Foix's case, the ependyma as well as the subjacent white matter were involved, the ventricles grossly distended

pressing laterally upon the basal ganglia. It seems that in all the cases so far observed and recorded the striate bodies are found to be in one way or another more or less involved. Also in the purely clinical cases (without post-mortem verification) besides the symptoms under discussion there were also certain manifestations which were strongly indicative of a striate invasion (Cases II, III, IV, V, VI, VII, VIII, IX, X, and XI by Alajouanine. *Annales de Médecine*, 1923, p. 260). Among the latter may be mentioned a high degree of hypertonia which may exist without definite pyramidal symptoms. The Cases X, XI, and XII of Alajouanine presented such clinical pictures. In every one of my cases (see above) the hypertonic state of the involved limbs was strongly present when the least attempt in a passive or active manner was made to perform a movement. It is precisely the state of this hypertonicity without distinctly pyramidal signs (absence of the toe phenomenon) that we have good reasons in the state of our present knowledge to attribute to the function of the extrapyramidal system. In a recent observation made by Boutier, Alajouanine et Girot (*Revue Neurologique*, 1922, Dec. 14, p. 1514), the patient following an attack of encephalitis lethargica developed the Parkinsonian syndrome, flexion paraplegia, also loss of associated movements of convergence and of upward movements of the eyes and diminution of the associated movements of downward movements of the eyes (Parinaud's syndrome). In this case all the phenomena point to the involvement of the gray nuclei in the upper part of the mesencephalon. Parinaud's vertical paralysis of the associated movements of the eyes is usually attributed to an involvement of the anterior quadrigeminal bodies, although some writers believe it to be due to a pontine lesion (Lhermitte, Bollack et Fumet, *Revue Neurologique*, Janvier 12, 1922).

The Parkinsonian symptom-group according to the prevalent opinion finds its explanation in an involvement of the basal ganglia and of the locus niger. As to the pyramidal system, it was involved in this case, since the tendon reflexes were increased, the plantar reflex was in extension only on one side. It was evidently a mixed case; the flexion contracture, the increased defense reflex, the abolition of the cremasteric and abdominal reflexes, the flexor plantar reflex on one side,—all these symptoms belong to the clinical picture of the "flexion paralysis type." In the above described anatomo-clinical case of Alajouanine there was also a combination of symptoms of the extensor and flexor types of paralysis. In all such cases the predominance of manifestations of one or of the other type depends upon the predominant seat of the lesion or lesions. The

last case particularly, as well as all other cases of the literature and my personal cases—all tend to suggest strongly the important rôle of the extrapyramidal system in the production of the special clinical entity which is to be distinguished from the classical pyramidal symptom-group. It seems therefore that the independent activity of the centers in the spinal cord (spinal rigidity) can be manifested in two cerebral ways: (a) in an extensor paralysis and contracture due to a lesion of the pyramidal system above the mesencephalon; (b) in a flexor paralysis and contracture due (very probably) to an involvement of the extrapyramidal system.

The above described differential signs and the pathological findings in all the cases so far reported including those of the present work,—all speak in favor of such a pathogenetic conception. The latter has its diagnostic value, as it facilitates the localization of the anatomical disorder. From a physiological standpoint, however, it is possible that the two processes are not independent phenomena, that after all there is only one “decerebrate rigidity” and that a secondary or a later involvement of the extrapyramidal system only modifies the original extension form of paralysis. Indeed some observations point in that direction. For example, in the elaborate study of Alajouanine’s case (see above) we witness a transition of one form into the other which goes parallel with the extension of the original lesions. At all events, it is well to register the fact that the transformation of one form of paralysis into another with the disappearance of one group of reflexes and appearance of other reflexes—are all indicative of the extension of the pathological process, namely, from the pyramidal to the extrapyramidal system. Such a development is an important prognostic feature of the entire subject under discussion.

CONCLUSIONS

- (1) Flexion paralysis is a well established clinical entity.
- (2) It may appear early in the course of an organic nervous affection or more frequently late after a period of extension paralysis.
- (3) Its chief characteristics are: increase of the defense reflex upon passive or active stimulation; diminution or loss of the tendon reflex, abolition of cutaneous reflexes.
- (4) The condition may be due to a spinal cord lesion (usually compression) or to a lesion in the brain.
- (5) In the cerebral cases the lesion may be bilateral or unilateral.
- (6) The spinal automatism in all such cases is the result of a lesional interference with the physiological inhibition exercised by the brain upon its connections with the spinal cord.

(7) The extension paralysis is a purely pyramidal affection, while the flexion paralysis is very probably due to an extrapyramidal involvement.

(8) There are mixed cases, in which the first is subsequently transformed into the other, or both exist parallel modifying of course some of its manifestations.

(9) Such a transition of one to the other is of grave prognostic omen as it points to an extension of the lesion.

(10) Unilateral cerebral affections may, like the bilateral ones, produce the same symptomatology except that it is confined to one side.

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STAMMERING AS A NEUROSIS

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The newborn babe comes into the world at the end of a long, long trail of evolution, bringing with it the untamed and untrained instincts of the whole animal kingdom. He also comes into the world possessed by sensation and emotion. We might express this as emotion-mass. Also this emotion-mass has as one of its components, eroticism. I know many will not have thought of this before but many times does the infant of a few days old show positive, definite evidence of this eroticism by the frequent erections which he exhibits.

This emotion-mass grows as the fond, loving mother washes, rubs, pats and caresses the body of her infant, always increasing at the same time its eroticisms. During the first year the infant is the lord of the manor. He has heaped upon him every form of love and care. His every cry is attended by loving service. His every wish is anticipated and granted scarcely before it is expressed and the result is that the infant of one year is a despot possessed by an overwhelming emotional tone.

Here I wish to digress for a moment and show two methods of training the infant. There are two mothers. The first one, a dear, devoted mother, spends hours daily caressing the body of her infant. She rubs, pats and strokes the various skin areas and spends hours holding the infant at her breast, thus increasing the great erotic emotion already possessed by the child. This makes for irritability, instability and nervousness. The second mother quickly makes the toilet, quickly nurses her infant and lays it away in its basket to play, sleep and to develop in a normal, reasonable manner. The first child may be potentially ruined while the second child has great probabilities of remaining happy, well, and free from neuroses when adulthood is reached.

At the beginning of the second year the training is usually very much changed as the mother, or surrogate mother, now begins to train the infant for obedience and cleanliness. The infant's emotional life begins to change because of scoldings and punishments inflicted by a mother who, until now, has been all kindness and love toward her child. This change may be so great that to the child it

amounts to cruelty. As a result of this training, great repressions begin to take place in the mind of the child and there is danger that a fear or dread complex may be developed. Repressed libido leads to dread, fear and anxiety.

During the second year there begins to be developed one of the greatest achievements of civilization—speech, without which civilization would never have come to the world.

During the third year this achievement is approaching perfection so that by the end of the third year the child can speak clearly and plainly. He has accomplished in a few years that which it took the human race a hundred thousand years to develop.

The mechanism of repression is very active during the period of life from the third to the fifth years. The neurosis is the price we pay for civilization. Civilization makes great demands upon the child; he must behave well, he must be clean in his habits, he must meet new faces and must make no mistakes in talking to people and could the child grow to adulthood with no scoldings, no whippings, no secrets to keep, no inferiorities to hide and no primitive instincts to master and subdue, there would be no neurosis and therefore no stammering.

Freud points out the root of the feelings of dread when he says, "Dread in children is originally concomitant with their missing the beloved person (mother); that is why they meet any stranger with dread; they are afraid of the dark because they cannot see the beloved person (mother) in it, but are easily calmed down when they can take the person by the hand." In the beginning of this article I showed the development of the great emotional love possessed by the child. If this love is returned by a parent or superior, then the child is happy and comfortable; but when his love is not returned, then he becomes depressed, sad, irritable and at times hateful. Unrequited love makes for fear and dread in the mind of the child. He misses the beloved mother as she was during the first year of his life. At school he receives but little love. To him, the teacher represents the stern and harsh father and again he is depressed and fearful. All of which helps to build into his mentality the fear or dread complex.

Stammering may begin at almost any age but most frequently between the ages of three and five years. Appelt of London says oftenest at three and one-half years. Stammering may not begin until the child starts to school for here again his libido undergoes repression. It frequently happens at about this time—three to five years of age—that some knowledge has come to him which for some reason must be held a secret. Some older boy may have told him

something of a sexual nature and also told him that under no circumstances should he tell his mother. He determines not to tell her but some day he rushes into the house to ask her some question while at the same time the forbidden knowledge is present in the mind. He attempts to ask the question, a conflict results which makes it impossible for him to talk easily but instead he stutters and stammers and the habit is begun.

Frequently he is scolded and ridiculed and when he tries again to speak he meets with the same success, or rather failure, and after a few trials his habit becomes fixed and he is a stammerer. The question is frequently asked as to how great a factor is simple imitation in the production of stammering. Upon the surface it would seem to be great because it is so common for one child to mimic another who has a speech defect. But many of the best investigators believe that without a great dread or fear complex, the habit quickly and spontaneously disappears. However, when the boy identifies himself with a beloved relative, as a grandfather, this identification may prove a serious handicap in the removal of the defect.

I have tried to show how fears and dreads may originate in early childhood. These fears constellate in the unconscious mind of the child and finally attach themselves to his speech. This is a hysterical symptom or conversion, the same as a paralyzed arm, leg or a blind eye (when such are functional), and relieves the mentality just the same as any other hysterical conversion. Again, when a person converts a complex into a physical symptom he is always relieved mentally and that is why the hysterical symptom is so hard to dislodge. The patient enjoys being ill; he unconsciously enjoys his stammering. All symbols carry energy and relieve the unconscious conflict and stammering is such a symbol.

The stammerer universally feels that he is inferior and also he is very sensitive. He is a victim not only of stammering, but of an inferiority complex. Somewhere during his infantile life a mistake was made in his training and he is convinced that he is unworthy and inferior. To make himself consciously comfortable he begins to compensate in lines in which he can excel. The stammerer frequently leads his classes in college and university. Sometimes his compensation makes him, as Demosthenes of old, a great and celebrated orator. This he does to make himself comfortable. However great a compensation he makes, *he is never quite free from his neurosis.*

Until recent years every characteristic of the child was explained upon the basis of inheritance. Heredity was used to explain every manifestation, both mental and physical, which was shown in the

life of the child. The build, the color of the hair and eyes and other physical characteristics are still to be explained upon the basis of heredity. So also may many of the mental qualities be explained; but during the last few years many of the leading psychiatrists believe that many mental manifestations are not inherited but acquired from the environment by the mechanism of identification.

The mechanism of identification works somewhat in this fashion: The boy, for example, takes the father or surrogate father as a model to imitate. He not only imitates his father but he takes over and builds into his own infantile mind the mannerisms and the methods of thinking and acting of the highly respected and worshipped father. Freud says: "Identification in the boy is always a masculine trait." He wishes to be *like* the father. Of course, identification is a form of love, but this sort of love is different from the love which he has for the mother which leads to the desire of possession. That is, he wishes to possess her as a love object. Identification wants to *be like* while love of mother or mother love wants to *possess*. As mentioned before, the boy may identify himself with a father or grandfather who stammers and this identification becomes a factor in the stammering and also prevents the cure.

Do not understand that I am rejecting heredity; far from it, but I am trying to make plain another mechanism whose importance is very great. Heredity gives to the child all of the racial characteristics but fails to explain some very important mental traits. If heredity were all, then mental therapeutics would indeed be a very discouraging field of medicine; far more discouraging than it appears to be at the present time (White).

As we are considering stammering in the light of a neurosis, it is in order to consider the conscious conflict and its effect upon the curing of stammering. From very early life, the infant has been taught and trained by his father, his mother, the Sunday and day schools to be a moral, social creature. By the time that adulthood is reached, he has definite, positive ideas as to right and wrong. He knows absolutely how he should live and yet he frequently attempts to go against his early moral training and commit acts which to him is sin. He tries to prove that he can break the law without paying the penalty but the penalty is always paid. Of course there may be unconscious conflicts underlying the conscious ones but it is doubtful if one ever does his best in fighting his conscious desires. As soon as he transgresses his early training a conflict is produced which makes it impossible for him to do his best mental work and as long as this conflict exists, it is practically impossible to cure stammering or

any other form of neurosis. The patient must tell his whole story and correct the wrongs done just as far as it is possible for him to correct them. He must atone for his crimes. If, however, he has had no moral training this factor is small.

As to the treatment of stammering one might consider first, persuasion and suggestion. There are some patients who under persuasion and suggestion can force the dreaded defect out of existence, but always as in any other hysterical conversion, there is great danger of a far more damaging symptom appearing in its place. I do not feel that one can safely run this risk.

Second, this being a neurosis pure and simple, drills and breathing exercises are unnecessary.

Third, the greatest hope of improvement and cure lies in a rational, thorough psychoanalysis. All of those terrifying, unhappy experiences of childhood carrying fear, shame, embarrassment and dread must be brought up into the conscious mind and mental adjustments to them be made. Also all experiences which have an infantile sexual value must be recalled and made conscious. So also must the family relations be discussed and adjustments to them be made. In my experience this method gives the best results.

CASE REPORT

The following case shows not only the effect of the early sexual experience but also the effect of the conscious conflict, both upon the disease and the cure. This is a case of a highly educated young woman 19 years of age, a prominent church and Sunday school worker. Her stammering was very bad. She frequently found it impossible to tell her name, etc. Analysis revealed a sexual experience at four years of age and shortly after that experience she began stammering. After that early experience together with many other lesser experiences were uncovered she became somewhat disturbed only to be followed by improvement but there seemed to be more to discover. She finally told her story which was as follows: "When I was nine years of age my father bought for me a collie pup. We became great pals and when he—the pup—was about two-thirds grown we were at play in a field of corn one day and while I was stooping over he jumped upon me from behind and made sexual contact. This act was repeated the next day and from then on till I was 16 years of age this act was repeated very frequently. I tried many times to quit this disgusting affair but it seemed that I could or would not do it. I was full of fear, shame and embarrassment. Finally the dog died and I felt better. For years I wanted to tell this horrible thing but did not dare."

Following this confession she rapidly improved and now after five years she only very rarely has any difficulty with her speech. This conflict was not a primary etiological factor in this neurosis but I do believe it was a very important overdetermining factor in the prevention or retardation of the recovery. This young woman is now married to a very highly respected young man and is a very happy mother.

GENTIAN VIOLET INTRAVENOUSLY IN CHOREA AND ENCEPHALITIS

REPORT OF FOUR CASES

JOHN W. VISHER, M.A., M.D.

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Gentian violet was first used intravenously in septicemia with very good results by Smith and Casparis¹ and by Young and Hill.² Royster³ also used it with apparently favorable results intraspinally and intravenously in a case of streptococcus meningitis, although the case finally terminated fatally. Later, Major⁴ reported a case of recovery from subacute infective endocarditis following gentian violet therapy.

Recently Blake⁵ reported a case of streptococcus septicemia successfully treated with gentian violet and mercurochrome intravenously. He concludes that further trial of these drugs in similar cases is distinctly indicated. Hinton⁶ reports the use of gentian violet intravenously in eleven cases of extreme septicemia with very gratifying results and concludes that further trial of this drug is indicated in similar cases.

So far as I know, the use of gentian violet has never been reported in chorea or in encephalitis. I am, therefore, reporting four cases in which its use intravenously apparently hastened recovery, if it did not actually prevent a fatal outcome.

Case 1. R. J., boy aged six, whose family history was negative and whose past history was of little importance except for tonsillectomy at four years of age, developed about November 1, 1924, symptoms of a low-grade toxemia. He was listless, restless and would go to sleep at school. The latter part of November his temperature was 102. His condition became gradually worse until December 19 when I saw him for the first time. The week before his temperature had varied from 100 to 103, and his pulse varied between 120 and

¹ Smith, D. T., and Casparis, H. Gentian Violet in Staphylococcus Septicemia. J. A. M. A., 26:2184 (Dec. 29), 1923.

² Young, H. H., and Hill, Justina H. Treatment of Septicemia and Local Infections by Mercurochrome 220 Soluble and by Gentian Violet. J. A. M. A., 82:669 (March 1), 1924.

³ Royster, L. T. Am. Journal Dis. of Children, 28:35 (July), 1924.

⁴ Major, R. H. J. A. M. A., 84:278 (Jan. 24), 1925.

⁵ Blake, Gerald. The Med. Clinics of N. Am., 8:1541 (March), 1925.

⁶ Hinton, Drury. Results of Intravenous Use of Gentian Violet in Cases of Extreme Septicemia. Annals of Surgery (March), 1925, p. 687.

130. Upon examination I found an inflamed nasal mucosa, a faint systolic murmur, a leukocyte count of 13,500, a negative urine and Widal. Roentgenograms of his head showed cloudiness of the left maxillary sinus. He was very restless and could not sit still. He exhibited the characteristic emotional reactions, and the grimaces and winking of chorea, but no weakness or spasmodic movements of any extremity could be found. He looked and acted like a very sick boy. A diagnosis was made of a subacute endocarditis with beginning chorea. On December 20 he was given 8 c.c. of a 1 per cent solution of gentian violet (4 mgs. per kilo) intravenously. There was no untoward reaction and improvement began at once. His temperature did not rise above 100; he was much more quiet and the grimaces disappeared. He gained two pounds in weight in the next three weeks. A second similar dose was given three weeks after the first, after which he had no fever and improved rapidly in every way. No other medication was used so that the improvement should, I believe, be credited to the gentian violet.⁷

Case 2. C. G., a school girl aged six, whose family and personal history were inconsequential, developed typhoid fever October 15, 1924. The diagnosis was confirmed by a positive Widal. The course of the disease was not unusual until the beginning of the fourth week. Her temperature which had reached 105 the second week, had fallen to normal several mornings, and she seemed to be recovering nicely when she suddenly developed an active delirium and was held in bed with great difficulty. In about two days this developed into a demented state. She could not talk, understood nothing, and cried continuously in a wild manner. I saw her first November 20 in consultation with Dr. C. D. Weaver when she had been in this condition a week. She was emaciated and looked very sick. Her pupils were widely dilated, and her face had a wild, staring expression. She kept her head thrown back in a position resembling opisthotonos, but her neck was not stiff and Kernig's sign was negative. Her temperature was 100, pulse 110, respiration 20. Her mental condition was becoming steadily worse. She had no control of bladder or rectum, and tossed about in bed continually. Large doses of chloral per rectum were necessary to secure any rest. At that time I gave 3 c.c. of a 1 per cent solution of mercurochrome (2 mgs. per kilo) intravenously, immediately following which there was an acute febrile reaction. For the first three days there was a severe diarrhea and no improvement was noted in her condition. Six days after the administration of the mercurochrome, I administered 3 c.c. of a 1 per cent solution of gentian violet intravenously. There was no untoward reaction and very decided improvement was noted 36 hours later. She was much more quiet, seemed to recognize people, nodded assent

⁷ Coleman and Bell gentian violet was used in this series of cases. The technic used was as follows: .2 of a gram of gentian violet was added to 20 c.c. of cold, freshly distilled water in a new bottle. The bottle was corked and thoroughly shaken for ten minutes. The solution was then filtered through paper into another bottle, and allowed to stand for at least thirty minutes to sterilize itself. The required quantity of this solution was aspirated into a sterile luer syringe, and injected slowly into the vein. Because of the opacity of the solution, I find it advantageous to have an extra syringe loaded with normal saline. A few c.c. of normal saline is injected first and the gentian violet syringe is then connected. Spilling into the tissues should be avoided as induration and pain result. Thrombosis of the vein has not occurred in my series.

when asked questions, and slept all of the second night. Improvement continued steadily, but it was ten days before she began to talk. At first she spoke in monosyllables very indistinctly, but her speech slowly improved. Six months afterwards her speech was still very slow, and her enunciation imperfect, but she was otherwise normal.

Case 3. B. W., a farmer boy aged seventeen, whose past history was unimportant except for a severe attack of influenza in 1918, developed typhoid fever October 30, 1924. The course of the disease was not unusual until the fourth week, when in spite of a waning temperature he developed a very active delirium. He was seen by my associate, Dr. C. D. Weaver, to whom I am indebted for the notes on the case. At that time his temperature varied from 98 to 101. He was completely disoriented to time, place and person. He could not lie still and restraints were necessary to keep him in bed. He tore his clothes and fought like a madman. His condition was growing steadily worse, when 10 c.c. of a 1 per cent solution of gentian violet (3 mgs. per kilo) were administered intravenously. No untoward reaction followed, and distinct improvement was noticed within eight hours—he was somewhat quieter and better oriented to place and person. Improvement continued rapidly so that by the third day he was perfectly quiet and rational. Convalescence was entirely satisfactory. He gained weight and strength rapidly and had no further difficulty of any kind.

Case 4. L. D., a school girl aged eleven, whose family and personal history were inconsequential, developed typhoid fever February 10, 1925. The Widal reaction was positive. She grew steadily worse and on February 14 she became delirious. She was admitted to the Twin Falls County Hospital February 24, at which time her temperature was 104, pulse 140, and respiration 40. Her clinical symptoms and delirium gradually improved until about March 1, when she developed symptoms of cerebral irritation. These symptoms grew progressively worse until March 10, when I saw her for the first time in consultation with Doctors C. A. Emes and F. W. McManus. At that time her temperature was 102.2, pulse 116, and respiration 20. Her pupils were widely dilated, but reacted to light and accommodation. The tendon reflexes were brisk, but Kernig's sign was negative. She kept her head thrown back most of the time, but her neck was not stiff. She could not talk, and did not recognize anyone. She threw herself about in bed, had no control of the rectum or bladder and cried continuously as if in pain. Every manipulation aggravated her nervous state. Her face was drawn, and had a wild, staring expression. Restraints were necessary, and sleep was possible only while under morphine.

I administered 10 c.c. of a 1 per cent gentian violet solution (5 mgs. per kilo) intravenously on the evening of March 10. There was no untoward reaction. Definite improvement was noticed within ten hours. She was quieter and her face was less drawn. She no longer threw her head back and seemed to notice something of what happened about her. On the second day she was much quieter, and more alive to her surroundings. She now remembers certain things that happened on the second day. On the morning of the third day, her temperature was normal for the first time and it remained so

all day. Also on the third day she looked at a book, pointed to various pictures in it, and smiled. On the fourth day after the injection of gentian violet she spoke for the first time in two weeks, and was quiet all of the time, sleeping without morphine. Her speech was thick with poor articulation at first. Improvement continued rapidly and within a week her speech and mental reactions were entirely normal.

COMMENT

Although this series is not long, the results achieved were, I believe, sufficiently striking to be of distinct value. All four patients were growing progressively worse when the treatment was administered. Improvement commenced within a few hours in all four cases and continued without relapse to complete recovery. In only one was a second injection deemed necessary. No febrile or other reaction followed the injection of the drug, so that it would seem certain that improvement should be credited to the bacteriostatic or bactericidal action of the drug upon the invading microorganisms in the brain.

The unfavorable report of Brill and Myers⁸ is based on one case of staphylococcus bacteremia in which gentian violet was used unsuccessfully. Since no autopsy was made the presence of multiple pyemic abscesses was not ruled out. As the successful treatment of such abscesses without drainage is obviously impossible, the failure of the drug in this case should not militate against its further trial especially since in the dosage used it is apparently entirely harmless. Brill and Myers⁸ also report certain experiments with culture media used with gentian violet in the concentration of 1:10,000. They conclude that exposure for three hours to this concentration was not bactericidal to the streptococcus, the staphylococcus, or *B. coli* communior. Even if we grant the accuracy of their observation, yet we must admit that it is entirely possible for gentian violet to be more bactericidal in the blood and tissues than in culture media, since *in vivo* it acts in conjunction with the natural defenses of the body upon somewhat attenuated organisms, while *in vitro* it acts alone upon virile organisms. Furthermore, so far as I know, the effect of the drug upon filterable viruses (the probable cause of encephalitis) has not been studied. Gentian violet may be even more toxic to them than it is to the staphylococcus or streptococcus.

CONCLUSIONS

1. Three cases of encephalitis following typhoid fever, and one case of chorea with endocarditis are reported in which prompt recovery followed the intravenous administration of gentian violet.

⁸ Brill, I. C., and Myers, H. B. Mercurochrome 220 Soluble and Gentian Violet. *J. A. M. A.*, 84:875 (March 21), 1925.

2. No change was made in other medication or management, so that the drug seemed responsible for the decided improvement in each case.

3. Further trial of this drug is warranted in similar obscure infections, especially since it seems to be entirely nontoxic in the dosage used.

SOCIETY PROCEEDINGS

CENTENNIAL CELEBRATION IN HONOR OF CHARCOT

Paris celebrated the hundredth anniversary of the birth of Jean Martin Charcot the last week in May, 1925. Many nations were represented at the celebration. On the first day, two sessions, held at the Salpêtrière, were devoted to papers on amyotrophic lateral sclerosis. The second day, the Société de neurologie held a special meeting in remembrance of its twenty-fifth anniversary, and Professor Guillain, the occupant of Charcot's professorial chair, delivered an excellent address. In the afternoon ceremonies were held at the Académie de médecine, and the élite of the medical profession of France gathered to hear Prof. Pierre Marie's eulogy of Charcot. In the evening, the president of France presided at a meeting at the University of Paris. Before an audience of 3,000, Dr. Babinski spoke of the activities of his former teacher, Charcot. Shorter addresses were given also by Professor Guillain, Professor Marinesco of Bucharest, Professor Roussy in behalf of the Société anatomique, Dr. Rist in behalf of the Société médicale des hôpitaux, Professor Calmette in behalf of the Pasteur Institute, Professor Lallemand in behalf of the Institut de France, of which Charcot was a member; Mr. Sinclair Tomson, president of the Royal Medical Society of London, and Mr. de Monzie, minister of public instruction. Babinski declared that Charcot was one of the greatest medical figures of the nineteenth century, since he combined the qualities of keen observation, patience and the capacity for hard work, without which genius has rarely an opportunity of manifesting itself. Being passionately interested in pathologic anatomy as well as clinical pathology, he succeeded, by means of intensive study in these two fields, in giving a description of disease-producing bacteria hitherto unknown, and the volume of creative work to his credit is immense.

Charcot's name is intimately associated with the Salpêtrière, where he served as intern in 1852, was appointed on the hospital staff in 1862; and remained until his death. This asylum, the largest in the world, offered him a marvelous field of study, and it was there that he performed the work that brought him so great renown. His doctoral thesis, published in 1853, on chronic rheumatism, was epoch-making, for he showed that the presence of an excess of uric acid in the blood separates frankly gout from the various forms of articular rheumatism, and he established the relationship between "dry" arthritis and nodose rheumatism. His clinical lectures on the diseases of old age have a particular value, and he, together with Vulpian, was the first to report a case of ulceration of the tricuspid valve associated with typhoid, this study being the first of a series of publica-

tions that made ulcerative endocarditis more widely known. He was also the first to establish the symptoms and the pathogenesis of "intermittent claudication," resulting from arterial obliteration, of which he recognized the true nature by associating it with similar cases described eight years previously by Boulay and Goubaux in veterinary pathology. He was one of the first to make known in France exophthalmic goiter as described by Basedow in Germany and by Graves in England. He completed the description of aural vertigo, or Ménière's disease, and he conceived the idea of treating this affection with quinin sulphate, obtaining thereby satisfactory results. In 1872, he was appointed professor of pathologic anatomy at the Faculté de médecine of Paris, which position he held for a period of ten years, or until the chair was created for him at the Salpêtrière.

His enlightening lectures on diseases of the lungs, the liver, the biliary passages and the kidneys have remained famous. The stimulus that he gave to the study of pathologic anatomy at the end of the nineteenth century has been exceedingly fruitful, and the paths that he blazed will never be effaced. But it is mainly his works on neurology on which his undying fame will be based. Among these, I may mention his researches on softening of the brain, encephalitis and cerebral hemorrhage. He called attention, along with Bouchard, to the alterations of the smaller arteries of the brain which are the most frequent cause of cerebral hemorrhage. His work on the localization of diseases of the brain, which appeared in 1876, opened an important field. In numerous later publications he established the cortical regions injuries of which were followed by paralysis and descending degeneration. To the still controversial question of aphasia, he brought, in addition to general ideas, many facts critically established. His clinical studies on pure verbal blindness are, in this connection, especially interesting. His researches carried out, since 1862, in collaboration with Vulpian, on epileptoid trepidation of the foot, make him appear in the light of a veritable precursor. He discovered the signs by which the irregular and abortive forms of locomotor ataxia may be recognized. He emphasized the frequency of the laryngeal and gastric crises in tabes; these had been previously described, but he was the first to give a complete description of them. He discerned clearly the distinctive characters of anthroopathies in tabes, which in England are designated as Charcot's disease. The term "Charcot's disease" is applied even more frequently to amyotrophic lateral sclerosis, the clinical and anatomic attributes of which have been brought out by his illuminating articles, the perfect accuracy of which has been confirmed by the neurologists of all lands. Charcot was among the first to recognize that infantile paralysis is associated with an alteration of the cells of the anterior columns of the spinal cord. He was the first, through his researches on pseudohypertrophic paralysis, to distinguish, in the group of progressive muscular atrophies, those that are of spinal origin and associated with myopathies. Finally, we may refer especially to his studies on reflex amyotrophy of articular origin, and to his important researches, together with Pierre Marie, on a form of familial progressive muscu-

lar atrophy, to which the term "Charcot-Marie atrophy" has been applied. Charcot and Vulpian detached and individualized multiple sclerosis, and made known the anatomic and clinical characters of that affection. Charcot determined the complex symptomatology and the anatomic substratum, and pointed out that the lesions affecting the continuity of the axis cylinders account for the absence of secondary degeneration of the spinal cord and for the fluctuations usually noted in this disease. At the same time, he showed in what respects multiple sclerosis differs from Parkinson's disease, with which it had been hitherto confounded.

After having devoted the greater part of his life to anatomoclinical researches, Charcot occupied himself in his later years more particularly with the so-called functional affections—neuroses, and neuropathic and psychopathic phenomena. He gave a noteworthy description of convulsive tics and pointed out the characters that distinguish them from Sydenham's and Huntington's chorea. His lectures on hysteria are widely known. Students, French and foreign physicians, men of letters, philosophers and all types of thinkers, attracted by the discussion of psychologic problems, thronged his lecture room. Since that time, the ideas of most neurologists with respect to many points pertaining to hysteria have changed. Nevertheless, the investigations of Charcot in this field were stimulative. He contributed to the establishment of the idea of hysteria in males. He gave an excellent description of certain forms of paralysis occurring mainly in brachial monoplegia, which he termed "hysterotraumatic." He pointed out how they could be distinguished from paralysis associated with alteration of the peripheral nerves, caused by a traumatism, and showed that paralysis presenting exactly the same characters could be produced by suggestion. Just at this time, many questions were being raised in regard to hypnotism, or the power over a hypnotized subject conferred by suggestion. By a series of skillfully conducted experiments, Charcot established beyond all doubt that even hypnotized subjects retain sufficient control over their actions to resist suggestions opposed to their moral principles, which demonstration helped to dissipate erroneous conceptions which might have had a baneful effect on the social order.

Charcot died suddenly, August 16, 1893. During his lifetime, he was universally honored and enjoyed many special distinctions. Under his influence, Salpêtrière became a veritable mecca for neurology. In fact, one of the most important services that Charcot performed was the founding of a powerful school of neurology. His pupils on whom his mantle fell have made good use of the heritage, and it is to them that the modern French school of neurology owes its high rank.

[Paris Letter, *J. A. M. A.*, July 4, 1925.]

CURRENT LITERATURE

I. VEGETATIVE NEUROLOGY.

1. VEGETATIVE NERVOUS SYSTEM.

Pribram, B. O. SPASTIC NEUROSIS. [*Archiv. für klin. Chirur.*, Vol. CXX, No. 2, p. 207.]

This paper advocates the idea that a neurosis of the viscera often has its local origin in some nerveplexus in the wall of the organ involved. This in time sets up a vicious circle which has to be considered in treatment, as well as the local source of the irritation responsible for the neurosis in the first place. It also has to be borne in mind that these subjects present a coöperating element in the line of general myotonic overexcitability of the hollow organs or of some special organ or group of organs. In the respiratory apparatus we have spasm of the glottis and asthma; in the circulatory apparatus, migraine, Raynaud's disease and certain disturbances in conduction of the impulse in the heart. Spasms may occur at almost any point in the alimentary canal and also in the ureters and the bladder. It is impossible to explain a spastic neurosis by the vagus or sympathetic system as a whole system. The local spasm interrupts and prevents the normal course of the stimulus. The dilatation above the spasm is merely in accordance with the general law that contraction of any portion is always accompanied by relaxation of the portion just above. He cites some cases in which the causal irritation could be traced to some removable cause with the prompt cure of the neurosis. In one case there was a diverticulum in the esophagus. Correction of this cured the spasm of the glottis. In two other cases excision of a projectile in the abdomen cured the severe spastic obstipation or hyperperistalsis of the stomach. In four cases spastic constipation or spasm of the stomach was cured by appendectomy or breaking up of adhesions. In one case cardiospasm and hyperperistalsis of the esophagus were cured by gastropexy. Spasm of the esophagus is the typical example of associative fixation of the irritation. In one case the woman had swallowed a thimble which stuck in the esophagus but was easily pushed down into the stomach and was soon voided in the stools. Since then she has had spasm of the esophagus; it comes on every time she has to do any darning.

Bensaude, R., and Hillemand, P. HIRSCHSPRUNG'S DISEASE. [*Ann. d. méd.*, Dec., 1922, p. 425.]

R. Bensaude and P. Hillemand say that Hirschsprung's disease is more frequent than is usually described. It is found more often in

boys than girls, in men than women, and in infants than in adults. Two theories have been advanced to explain the nature of the disease—the first by Hirschsprung, who considered it an idiopathic congenital condition analogous to other hypertrophies, such as are found in the liver, spleen, breast, or bladder; the second regards it as a secondary condition due to some obstruction to the passage of the feces. The chief symptoms are obstinate constipation, distension of the abdomen, and the presence of a tumor with visible peristalsis. The course of the disease is essentially chronic, with acute exacerbations of fecal retention and violent peristalsis, ending in the passage of the accumulated fecal matter. Occasionally the condition undergoes spontaneous cure; more often the patient goes progressively downhill and succumbs to cachexia. The prognosis is bad, and the younger the child the worse the outlook. In the child the diagnosis is not difficult, but such conditions as tuberculous peritonitis and congenital occlusion of the intestine must be considered. The treatment should be medical in the first instance: a diet poor in indigestible residue, lavage of the intestine, and mild laxatives, whilst flatus must be evacuated by a rectal tube. If the condition does not improve, one of two operations must be carried out—ileo-sigmoidostomy, which is easy, quick, and safe, and has little risk attached to it, or colectomy, which is a long and difficult operation, but insures a cure. The latter is the operation of choice, and has a lower mortality when carried out in two stages. Psychogenic factors as developed in Lewis' complete study (*J. L. NERV. AND MENT. DIS.*, 1923) are neglected.

Rogers, R. R. SECONDARY (ACQUIRED) MEGACOLON. [*Ohio St. Med. J.*, March, 1923, XIX, No. 3. *J. A. M. A.*]

Rogers' patient was a full term infant weighing nine pounds, and apparently normal in every way except for the condition of the anus. When he was about twenty-four hours old the mother noted that his bowels did not move, and on investigation she found that the baby's anus seemed to be closed. The family physician discovered an anal opening which was just large enough to admit a small steel probe. He dilated this opening with the tip of an infant syringe. This operation produced some bleeding, but was followed by the passage of considerable meconium. After this the baby began having small flat stools. The movements were accompanied by a great deal of grunting and straining, and frequently abdominal massage was necessary to accomplish them. The child was breast fed and gained weight regularly, but for the first month its bowels were moved only with considerable difficulty. The movements were soft, semiformed and small, but even this type of fecal matter caused a great deal of straining and pain and the use of suppositories and enemata was painful and caused hemorrhage. At nine months cereal feedings were begun, and shortly thereafter small amounts of bread and butter, baked potato, carrots and prunes were added to the diet. Immediately the trouble

with the bowels became greatly aggravated. The stools occurred less and less frequently, were formed when they did occur, and were accomplished only by great straining and by screams of pain. By the use of abdominal massage and castor oil a stool was obtained about every third day until the child was a year old, but had frequent vomiting attacks and at times the vomitus had a fecal odor. With less frequent stools the baby's abdomen became more distended. The anal region was bisected by a thick, fibrous raphe which was continuous with the raphe of the scrotum. It was impossible to stretch this raphe enough to insert even the little finger into the rectum. The raphe was divided and removed and as good a sphincter as possible was constructed. The patient made a good recovery but the intestinal condition became worse. Roentgen-ray examination showed a dilated sigmoid. Operation disclosed an early Hirschsprung's disease or megacolon. The enlargement started immediately above the internal sphincter, and the diameter of the intestine was that of a small orange. This tapered up throughout the length of the colon to the hepatic flexure.

Sadler, F. J. ENDOCRINE INSUFFICIENCY AND CHRONIC INTESTINAL DISEASE. [Lancet, May 13, 1922.]

This author says that one-tenth grain of the thyroid extract administered once daily gives the best results in the neurasthenic discomforts of the climacterium and that dyspnea on exertion is an early sign of overdosing. Unexpected results were also achieved in arteriosclerosis associated with deafness and also in ovarian tumors. In deficiency edemas it aids by favoring diuresis. It has helped in epilepsy and melancholia in women. The connection between endocrine insufficiency and intestinal intoxication is shown by the improvement following the use of intestinal antiseptics. Ichthyol was found in albuminuria with chronic parenchymatous nephritis. Some chronic noninfectious diseases can be cured or improved by subcutaneous injections of heterogeneous bacillary proteins (Danysz), or by intravenous injections of peptone or heterogeneous bacillary proteins (Gow). The author recommends the use of endocrine gland substances and protein injections as auxiliaries. This is a good field for team work on the part of pathologist, nose and throat surgeon, gynecologist and general practitioner.

Nielsen, A. A. NORMAL GASTRIC MOBILITY. [Acta Rad., Aug. 31, 1922.]

A. A. Nielsen reviews the various opinions on the mobility of the stomach in healthy individuals during rest and motion. He finds a distinct difference in the emptying time of persons at rest and persons in motion. When patients were at rest, it was found that the emptying time was increased and a four to four and a half hours residue was usual. In women, whether at rest or in motion, the emptying time is longer than in men. From his observations the author considers that a six hours residue is not necessarily due to a pathological condition.

Westphal, K. MOTILITY, NERVES AND PATHOLOGY OF THE BILE DUCTS. [Wien. klin. Woch., Jan. 11, 1923, XXXVI, No. 2. J. A. M. A.]

Westphal observed with roentgen rays in many cases of gallstone colic a marked restriction of the movements of the right side of the diaphragm (a visceromotor reflex). An analogous sensory reflex is the sensitiveness of the right phrenic nerve in the neck which was present in many cases (15 among 25), similar to that found by Costa and Troisier in Weil's disease. He found in experiments on animals that the sphincter musculature extending to the duodenal papilla shares also in expulsion of the bile. Its function resembles that of the antrum and sphincter of the pylorus. Slight electric and pharmacologic irritation of the pneumogastric causes a contraction of the gallbladder and peristalsis of the sphincter. Strong irritation causes a general increase of tonus and retention of the bile. Irritation of the sympathetic or paralysis of the pneumogastric decreases tonus and inhibits motility. The evacuation of the bile is inhibited by hyperfunction of the muscles in the duodenal portion, by hypofunction of the muscles of the ducts and bladder, and as a reflex. He believes that the basis of pathologic conditions is a neurosis, which may appear either as an increased motility (for instance, in cholelithiasis of pregnancy), in other cases as a decreased motility. A survey of literature is given.

de Massary, E., and Walser, J. CONSTITUTIONAL IRRITABILITY AND RESPIRATORY SPASM. [Bull. de l'Acad. de Méd., Jan. 2, 1923, LXXXIX, No. 1. J. A. M. A.]

De Massary and Walser discuss almost monosymptomatic forms of what they call constitutional hyperemotivity, *émotivité anxieuse*. The cardinal symptom may be respiratory, circulatory or digestive. The respiratory affection merits consideration as a real morbid entity. It consists in a sensation of oppression, feeling of difficulty in breathing, and characteristic uneasiness, which may increase to actual distress. By distracting the patient's attention it is possible to diminish the severity of the disturbance. The influence of the pneumogastric nerve is the evident cause, and other manifestations of vagotonia are found constantly (oculocardiac reflex), or frequently in these cases (hyperacidity, sweats, respiratory arrhythmia, hypotension). Atropine has a curative action on the condition.

Tyson, W. J. ACUTE SUFFOCATIVE EDEMA OF LUNGS. [Lancet, Oct. 21, 1922, II, No. 5173. J. A. M. A.]

Tyson asserts that these are really cases of aborted pneumonia, in which the congestive stage is fully developed and then the disease stops, being relieved by the escape of the collected serum, to end either in rapid recovery or in rapid death. The consolidation of the lung is not often demonstrated, but the signs of acute congestion are present. In his case, which is cited, only one lung was attacked, and herpes on the lips was

present, both symptoms suggesting a pneumonic origin. Influenza seems to favor this condition, being the starting point of the pneumonia in two or three cases recorded—in Tyson's case an influenza epidemic was present in the district where the patient lived. Immediate venesection is the treatment generally recommended, together with outward applications, such as wet cupping and mustard plasters. Morphine, iodids, or blisters should not be used in the treatment of these cases, for obvious reasons.

Hurst. THE SUPRARENALS IN ASTHMA. [New York Med. Journ., March 11, 1922.]

Asthma, according to this author, is a constitutional condition in which the bronchomotor part of the vagus nucleus is abnormally active, and consequently responds too readily to blood-borne irritants and to peripheral and psychical stimuli. The overactivity of the broncho-constrictor fibers of the vagus are kept in check by the activity of bronchodilator fibers of the sympathetic owing to the constant secretion of adrenaline. Hypersensitiveness to certain proteins largely depends upon their depressing effect upon the suprarenals manifesting itself in depression of their normal activities in connection with the blood vessels, alimentary canal, or bronchi, giving rise in different individuals to vasomotor disturbances—for example, urticaria, vomiting and diarrhea, or an attack of asthma. Fright may stop an attack of asthma through its stimulation of the sympathetic and suprarenal secretion, and that asphyxia may have the same effect explains the relief which an asthmatic experiences if he continues walking up to a moderate degree of dyspnea, and for this reason exercise should be encouraged if there is shortness of breath during the first quarter of an hour. An adrenaline injection cuts short an acute attack of asthma more rapidly than any other treatment, 1 minim of 1 in 1,000 adrenaline chloride solution being sufficient, since it is not necessary to produce such general symptoms as a rise in blood pressure or rapid pulse. The injection should be given at the beginning of an attack and before it has fully developed, and in such small doses no unpleasant immediate or after effects result. It is the only form of injection which is justifiable for self-administration, because of the necessity for its being given directly the first symptoms of an attack are experienced.

Marine, David; Lowe, Blanche H., and Cipra, Anna. INFLUENCE OF GLANDS WITH INTERNAL SECRETION ON THE RESPIRATORY EXCHANGE. VII. THE POSSIBLE INFLUENCE OF SUPRARENAL INVOLUTION IN NEW BORN INFANTS ON HEAT PRODUCTION. [Jl. of Metabolic Research, September, 1922.]

In view of the fact that sufficient but sublethal destruction of the function of the interrenal gland (adrenal cortex) causes a marked chronic increase in heat production, provided the thyroid gland is intact, it occurred to the authors to determine whether the normal destruction of the fascicular and reticular zones of the interrenal gland in infants might also be

associated with increased heat production and, therefore, comparable to the experimentally induced interrenal insufficiencies. This spontaneous destruction of the two inner layers of the adrenal cortex is characterized by hemorrhage, degeneration and necrosis. The degeneration is fully established by the end of the second week of life and during the next five or six weeks rapid removal of the broken down cells taken place, leaving the thin glomerular layer intact.

Heat production was studied in ten normal babies every second or third day from birth to the thirty-fifth day of life. The normal metabolism for the first seven days of life is fairly well known and averages about 1.87-1.88 calories per kg. per hour. Beginning about the eighth day a sharp rise in heat production occurs, as first pointed out by Benedict and Talbot. The average metabolic readings for the ten babies grouped by weeks were as follows:

1- 7 days.....	1.88	cal.	per	Kg.	per	hour
8-14 "	2.14	"	"	"	"	"
15-21 "	2.15	"	"	"	"	"
22-28 "	2.30	"	"	"	"	"
29-34 "	2.24	"	"	"	"	"

A distinct rise, therefore, occurred during the second week notably greater than the combined rises occurring during the next three weeks. As regards time relations the rise in heat production coincides with the destruction of the inner layers of the cortex. It is suggested that the two processes may be related as cause and effect, although much more work will have to be done to establish or to disprove it. [Author's abstract.]

Larsen, N. P., and Bell, S. D. ASTHMA IN CHILDHOOD. [Am. Jl. of Dis. of Children, November, 1922, XXIV, No. 5.]

This clinical paper analyzes 100 cases of asthma and chronic bronchitis. Forty-four of the subjects investigated were shown to be sensitive to various proteins. Thirty-six were positive to animal emanations and of these thirty-two were positive to rabbit hair. Sixty positive reactions were obtained. Of these forty-nine, or 81 per cent, were positive to animal emanations and thirty-two, or 54 per cent, were positive to rabbit hair. In treating the sensitive type, removal of the protein from the environment gave marked immediate relief. In treating the nonsensitive type, simple hygienic measures gave relief in slightly more than half the cases.

Bufalini, E. ASTHMA AND TUBERCULOSIS. [Policlinico, Vol. XXIX, No. 22, p. 709.]

Another "test" contribution in which the author tabulates the findings in ten men and twelve women with asthma, recording the heredity, the antecedents, the response to tuberculin. In fifteen of the twenty-two some affection of the respiratory tract had preceded the asthma, but only a

few had been tuberculous. Tuberculin tests were positive in nineteen; active pulmonary tuberculosis was evident only in one.

Vaughan, W. T. SPECIFIC TREATMENT OF HAY-FEVER DURING THE ATTACK. [J. A. M. A., Jan. 27, 1923.]

In three cases of autumnal hay-fever, with sensitization to short rag-weed, the patient has been desensitized by the routine commonly followed, both parenteral injection and nasal installation being employed. One patient developed hay-fever in a very severe form, while two were decidedly improved but not symptom free, after the onset of the pollen season. In all three cases, symptoms cleared up almost entirely following daily subcutaneous injections of small amounts of ragweed pollen extract. A fourth patient, a boy who had developed hay-fever for the first time and had had no preventive inoculations, did equally well following daily subcutaneous treatment. The frequency of inoculations was gradually reduced in this case, the patient remaining greatly improved. According to the method proposed, patients presenting themselves for the first time during the pollen season, and without previous treatment, may be treated by specific measures, with considerable hope of relief (temporary).

Wieland, H., and Mayer, R. THE CONTROL OF THE NARCOTIZED RESPIRATORY CENTER BY LOBELINE. [Arch. f. exper. Path. u. Pharmacol., 1922, XCII, 195.]

Lobeline is shown to have a stimulating action on the respiratory center, in doses of 0.5–1.0 mgm. when administered to rabbits under urethane. The rate of respiration and the volume breathed per minute were both increased. This effect is still produced when the respiratory center is depressed by morphine or chloral hydrate. There is no mention in the paper of the nicotine-like effect commonly attributed to lobeline, since Edmunds' original description of it. Crystalline lobeline has no paralytic effect on the vagus nerve-endings in the bronchioles, and there is therefore no basis for its use in asthma.

Henkes, I. C. BRONCHIAL ASTHMA AS NASAL REFLEX. [Nederlandsch Tijdschrift v. Geneeskunde, April 15, 1922, Vol. I, No. 15, p. 1517. J. A. M. A.]

Henkes found abnormal conditions in the nose in all but one in a series of 12 cases of asthma of recent development and also in 40 of 48 cases of asthma of long standing. In these 51 cases, the electric current applied to the middle turbinate bone induced a kind of wheezing sound in the breathing, and breathing became more difficult. With pathologic conditions in the nose and pharynx, if this electric test is negative, the cause of the asthma must be sought elsewhere. But if the test is positive, then treatment of the nose, pharynx or some sinus is indicated. Insidious suppurative in the ethmoid cells is particularly liable to be responsible for this form of asthma. He reports a case in which the asthma subsided

permanently after the clearing out and healing of an abscess in the middle turbinate. In families in which there seems to be a predisposition to asthma, he has seen the older children develop at times a difficulty in breathing, ascribed usually to nervousness. He is convinced that this is the precursor of actual asthma, a sign of a pathologic reflex route from some anomaly in the nose. In three children of this type the anomaly proved to be adenoids, or an inflammatory process in the nasal mucosa, or unsuspected suppuration in the ethmoid sinus. All three had reacted with wheezing to the electric test, and none have displayed any respiratory disturbance since the cure of these processes. He applied for the test a weak faradic current through an oval metal plate with an area of about 0.25 sq. cm.; the other electrode at the back of the neck. In practice this test is seldom necessary. It is enough to treat any abnormal conditions found. If the asthma does not subside under this, then this electric wheezing test will reveal whether the cause is elsewhere, or more careful search should be made for it in nose and sinuses.

Gutmann, R. A. BRONCHIAL ASTHMA AND APPENDICITIS. [Presse Méd., Jan. 20, 1923, XXXI, No. 6.]

Gutmann reports four new cases in which attacks of bronchial asthma failed to reappear after appendectomy. In these cases of asthma of appendicitic origin, an attack of asthma can be brought on by applying pressure to the ileocecal region. His theory is that chronic appendicitis causes an abnormally irritable condition of the vagus nerve, and this vagotonia forms the soil on which disturbances of the colloidal equilibrium entail asthmatic attacks. He mentions a case of asthma in which the attacks were provoked by antipyrin. The patient bore this drug without disturbances after appendectomy.

Veyrières and Jumon. ASTHMA IN CHILDREN. [Paris Médical, July 29, 1922, XII, No. 30. J. A. M. A.]

This article discusses only the asthma occurring in children with an itching skin disease. The dermatosis plus the asthma develops in the young infant and usually becomes attenuated by the fourth or fifth year and disappears as a rule at eight or ten or at puberty at latest. The skin and the bronchi react as a double reaction on a given constitutional soil. The local treatment of the skin lesions varies with the form observed. There may be pruritus with eczema at one point and lichen at another or infectious processes. Cod liver oil internally and externally may give good results. The child should occasionally defecate in a vessel containing a little water. If no droplets of fat float on the water, the dose of cod liver oil can be increased. He regards as illusory the fear of metastasis from too vigorous treatment of the dermatosis. Bed rest, a mild saline purge and hot drinks combat the attack of asthma; if very severe, a wet pack to the trunk or packing the legs

to the hips in cotton, leaving it for hours at a time. With severe spasms and evidences of bronchiolitis, he gives iodid and belladonna, but never for more than three days at a time. The effect of epinephrin and pituitary treatment has been too variable for them to be relied on. All these children have an inherited taint, nervousness, "lymphatism," arthritism or alcohol or coffee intoxication; syphilis was not manifest in the experiences related. All cases of asthma in children which tend to final recovery at or before puberty belong in the category with this *asthme intriqué de dermatoses prurigineuses*. It is a *maladie d'évolution*.

Hubert, L. VEGETATIVE NERVOUS SYSTEM OF THE NOSE AND THE MECHANISM OF SOME OBSCURE NASAL SYMPTOMS. [The Laryngoscope, July, 1922.]

The nose is innervated by both the sympathetic and the parasympathetic nervous systems. The sympathetic postganglionic fibers are derived from the superior cervical ganglion, and the parasympathetic postganglionic fibers from the sphenopalatine ganglion. The former supply the nose mostly with vasoconstrictor, and the latter with vasodilator nerves. Both contain secretory fibers, but the majority of these fibers are derived from the parasympathetic system. Attention is called to the fact that the involuntary nervous system is not in itself capable of reflex reactions. The cells of the autonomic ganglia cannot act spontaneously, but require for their excitation impulses which originate in the cells of the cerebrospinal nervous system. This physiologic principle is utilized in explaining the mechanism of some obscure nasal symptoms.

Referred or Sympathetic Pain—Sluder has described a syndrome (neuralgic type of sphenopalatine ganglion neurosis) in which the pains are attributed to disease of the sphenopalatine ganglion. Hubert points out that this ganglion, belonging to the parasympathetic nervous system, has nothing to do with pain, with a possible exception of causing sore throat, as Winkler has shown that the sphenopalatine ganglion may contain some sensory cells, which supply the palate. The fact that cocaine in the region of this ganglion relieves most of the pains indicates that they are probably due to irritation of the fifth nerve, as this drug has a selective action on somatic sensory nerves. Pain referred to regions far removed from the distribution of the fifth nerve also occurs, and its explanation must be sought in a disturbance of the afferent autonomic neurons. The presence of such neurons in the nose, however, has not yet been definitely proven.

Sneezing—The mechanism of sneezing is quite complex and involves both the voluntary and the involuntary nervous system. Impulses travel along the irritated branches of the fifth nerve to the vasodilator and secretory motor centers in the medulla. The impulses are then referred back to the nose along the preganglionic fibers which take their course through the nerve of Wrisberg, the facial nerve, the large superficial petrosal nerve, and finally reach the sphenopalatine ganglion. From

this ganglion postganglionic fibers are given off to the nasal glands and blood vessels. There occur a dilatation of the blood vessels and a discharge of mucus. The latter is probably specific in character and excites some of the terminal filaments of the fifth nerve. Whereas any irritant within the nose will cause impulses to travel along the fifth nerve to the vasodilator and secretory motor centers in the medulla, the impulses which are initiated by the above mentioned mucus, follow a different reflex arc. They are transmitted to the inspiratory center near the vagus nerve nucleus. This causes a deep and spasmodic inspiration, which is then followed by a forced and spasmodic expiration.

Rhinorrhea—The mechanism of rhinorrhea is very similar to sneezing and practically the same neurons with the exception of the neuron to the inspiratory center are involved. This explains why they are so frequently associated. Sluder believes that they are caused by disease of the sphenopalatine ganglion. (Sympathetic type of sphenopalatine ganglion neurosis.) But inasmuch as this ganglion is surrounded by branches of the fifth nerve, which partly penetrate it, it is difficult to conceive that the ganglion alone is irritated without simultaneous irritation of the fifth nerve. It is more reasonable and in agreement with established physiologic principles to assume that afferent impulses pass by way of the fifth nerve to the medulla and from here back to the nose by pre- and postganglionic fibers. That this is the probable mechanism is shown by the application of cocaine to the region of the sphenopalatine ganglion. The impulses traveling through the irritated fifth nerve are blocked by the cocaine and an improvement in symptoms, though temporary, is obtained. When cocaine is applied to any part of the nasal mucus membrane, it anesthetizes only those sensory filaments with which it comes in direct contact, but when it is applied to the region of the sphenopalatine ganglion, it catches all those branches of the second division of the fifth nerve that surround the ganglion. The result is a complete anesthesia of practically the entire nasal mucus membrane.

Lacrimation—Clinical and experimental evidence have shown that the secretion of tears is produced by the effect of the involuntary nervous system on the lacrimal gland, which is supplied by sympathetic and parasympathetic fibers. The effect of the sympathetic fibers on the gland is not definitely known. It is known, however, that the sphenopalatine ganglion sends out postganglionic secretory fibers to the lacrimal gland. The preganglionic fibers take a very similar course to those of sneezing and rhinorrhea.

Dysmenorrhea—It is possible that in certain types of dysmenorrhea, especially of the congestive type, nasal disturbances may be a factor in reflexly stimulating the vasodilator centers of the genital apparatus in the medulla and sacral portion of the spinal cord. This may at the time of menstruation lead to increased congestion of the pelvic viscera. It is also possible to conceive that nasal treatment, *e.g.*, the application

of cocaine may not only prevent impulses from passing to the vasodilator center of the genital apparatus, but also reflexly stimulate the vasoconstrictor center in the medulla and lumbar portion of the spinal cord. This would deplete the congestion within the pelvic organs and relieve the pain. The mechanism of atrophy and ozena, of asthma, nausea and vomiting, due to nasal disturbances, are briefly discussed. Finally the effects of the emotions on the involuntary nervous system of the nose are alluded to. Some of the symptoms described, like rhinorrhea, sneezing, lacrimation, dysmenorrhea, nausea and vomiting, may be due to psychic states of an emotional character. This must be kept in mind in order to evaluate the symptoms properly and to treat the patients intelligently. [Author's abstract.]

De Almeida, G. EMOTIONAL FACTOR IN GLAUCOMA. [Braz. Med., Jan. 13, 1923, I, No. 2. J. A. M. A.]

De Almeida reports six cases in which the emotional stress of an operation for cataract seemed to have been a factor in the sudden increase in the eye tension. The acute glaucoma was transient, and had disappeared by the next day. One elderly patient had borne the operation on one eye calmly, but was extremely agitated at the operation on the other eye, a month later, and the glaucomatous condition developed at once. Another patient was a young man with traumatic cataract, and his dread and excitement at the operation were extreme. The operator must be on the alert to detect the first sign of augmented tension and apply the necessary measures without a moment's delay. To this he attributes the favorable outcome and the fact that he has never had expulsive hemorrhage after his numerous cataract operations.

2. ENDOCRINOPATHIES: PARATHYROID, SUPRARENAL.

Salvioli, G. BEHAVIOR OF THE ADRENALS IN EXPERIMENTAL SCALDINGS. [Sperimentale. Arch. di biol., 1922, LXXVI, 190.]

Experiments were made by scalding the skin of guinea-pigs. According to the extension and severity of the scaldings, the changes of the blood circulation of the adrenals varied from a simple congestion to hemorrhages and blood coagulation. In the cells of the cortex the neutral fats, lipoids, and pigment were increased; in those of the medulla the chromaffin substance was diminished. The same results were obtained in guinea-pigs in which one adrenal had been previously removed. [da Fano, Med. Sc.]

Squier, T. L., and Grabfield, G. P. ADRENAL ENLARGEMENT IN RABBITS. [Endocrinology, January, 1922.]

The authors, in an effort to determine the mechanism by which thyroid feeding causes an enlargement of the adrenal glands, fed desiccated thyroid extract by the method of intubation to rabbits, to rabbits whose splanchnic nerve had been severed, to rabbits severely and to those mildly

traumatized. The results attained are summarized in the statement that trauma or stimulation will produce an adrenal enlargement of apparently the same kind as that resulting from thyroid feeding, but that the same trauma or stimulation plus thyroid will produce still greater enlargement. The enlargement in all cases was largely, if not entirely, cortical.

Michaux and Marsset. HEMORRHAGE IN SUPRARENAL CAPSULES. [Bul. d. l. Soc. Méd. d. Hôp. Feb. 2, 1923.]

This patient died suddenly after a severe diarrhea. The cadaverous odor was marked early. The blood pressure was high (168). Large hemorrhages were found in both suprarenal capsules with healthy vascular system.

Beumer, H., Schäfer, F. EPINEPHRIN HYPERGLYCEMIA IN INFANTS. [Zeitschrift für Kinderheilkunde, Vol. XXXIII, No. 1-2, p. 34.]

This clinico-experimental research tends to prove that the sugar content of an infant's blood rises with any intake of sugar. Hence this factor must be excluded if experiments with adrenalin are being performed. The sympathetic sensitization to epinephrin is enhanced also by calcium chloride. With spasmophilia and tetany, a subnormal glycemic reaction to epinephrin indicates hypotonia of the sympathetic system in some way apparently dependent upon the calcium ions.

Carrasco-Formiguera, R. THE PRODUCTION OF ADRENAL DISCHARGE BY PIQÛRE. [Am. J. Physiol., 1922, LXI, 254, Med. Sc.]

Puncture of the floor of the fourth ventricle (Bernard's piqûre) sends impulses along the splanchnic nerves and produces among other things hyperglycemia and glycosuria. A large amount of recent work has been done to determine whether the adrenals are involved in these effects. From the fact that hyperglycemia and glycosuria can be produced by piqûre after excluding the adrenals many observers have concluded that the adrenals are not involved. This conclusion does not logically follow from the observed facts. In the present paper evidence is furnished that piqûre produces a discharge of adrenalin from the adrenals in sufficient amount to produce a general effect on other organs.

Drummond, T. ASTHMA AND SUPRARENAL INADEQUACY. [Brit. Med. J., Feb. 24, 1923, I, No. 3243.]

This author presents a case which tends, in superficial analysis to show a relationship between inadequate suprarenal function and asthmatic attacks.

Marañon, G. OLDEST KNOWN CASE OF ADDISON'S DISEASE. [Sig. Méd., Dec. 23, 1922, LXX, No. 3602. J. A. M. A.]

Marañon reproduces the description by a priest in the sixteenth century of the sickness of a young priest who died three years after the first symptoms. They developed after a fright; the building was struck by

lightning and burned. The lay description portrays Addison's disease perfectly, but the pigmentation was ascribed to "smoke getting into the system during the fire." Marañon cites modern instances of an emotional origin. One of his patients developed the disease after seeing his child killed by a street car.

Deaderick, W. H. SYPHILIS OF SUPRARENALS. [Am. Jl. of Syph., January, 1923, VII, No. 1. J. A. M. A.]

A case of probable Addison's disease of syphilitic origin is reported by Deaderick. The patient was a woman, aged forty, who had married for the second time eight years previously. The husband admitted syphilitic infection twenty-eight years before with insufficient treatment. She had three miscarriages but no full term labors. Nine years ago she had pains in the liver region followed by marked jaundice, which was very persistent. For the past seven or eight months she has had vomiting attacks preceded by nausea. At first these attacks came on from one to three times a week, then they became more frequent until they occurred after almost every meal. She has lost fifteen pounds in weight during this period. For eight months she has been very weak. During some of the "weak spells" she is able to sit up, but frequently she is compelled to lie down, being too weak to sit. She has had dyspnea on exertion for several years. Seven months ago she consulted two throat specialists on account of sore throat and enlargement of the cervical glands. Both diagnosed syphilis and one prescribed antisyphilitic treatment by mouth which she took for two and one-half months causing resolution of the throat and gland trouble. About two months ago she noticed a cloudiness of the right cornea. Her present complaint is pigmentation of the skin, pain in the right hypochondrium and precordium, backache, weakness, vomiting and constipation. The treatment consisted of daily, intramuscular injections of mercury benzoate, up to one-third grain, and of the oral administration of suprarenal gland. After three weeks' treatment all the systemic symptoms were improved but no change could be detected in the cutaneous pigmentation. A month after discharge she reported that the discoloration was fading.

Wahl, H. R., and Walthal, Damon. THYMUS APOPLEXY. AN UNUSUAL MANIFESTATION OF HEMORRHAGIC DISEASE OF THE NEWLY BORN. [American Journal of Diseases of Children, July, 1922, XXIV, 27.]

Large effusions of blood, localized or diffused throughout the thymus gland are rarely reported, only nineteen cases having been found in the literature. Most of these cases occurred in young infants though two cases were reported in adults. A large proportion of the cases were associated with a history of syphilis or trauma. Two additional cases, similar in many respects, are reported. In both the thymus was enlarged and infiltrated with blood. One occurred in an infant four days old and the

other in one six weeks old. In both of these cases there were symptoms of meningeal irritation. There was no definite history of a birth trauma. In both cases there was a marked increase in the coagulation time of the blood. In each case the necropsy showed cerebral hemorrhages, inflammatory changes in the lungs suggestive of syphilis and a diffuse hemorrhagic infiltration of the thymus in which the extravasation of blood was both intralobular and interlobular and was associated with suppuration, necrosis and proliferation of the reticular epithelial cells. The hemorrhagic tendency in the younger infant was much more pronounced as evidenced by hemorrhages in the kidneys and myocardium which were unaffected in the other case. The immediate cause of death in the younger infant was the extensive cerebral hemorrhage while in the older child it was a broncho-pneumonia. There was more organization of the hemorrhage in the older infant and none in the younger one showing that the hemorrhage was older in the former. On the other hand the latter showed more striking perivascular inflammatory reaction with swelling of the vascular endothelium and also marked thrombophlebitis of the smaller veins. No positive clinical evidence of syphilis was obtained with the younger infant while a suggestive one was found with the older one. However, the blood Wassermann was negative in both infants. The histological changes in the thymus gland resembled closely lesions that have been repeatedly described as characteristic of congenital syphilis. The relation of thymus hemorrhages to syphilis is disputed, several authors maintaining that there is an etiological relation between them. Although the two cases reported, and all other cases in which a detailed microscopic description is available, apparently have a syphilitic basis, extensive hemorrhages in the thymus gland are not necessarily pathognomonic of syphilis. The etiology of this hemorrhagic tendency is obscure. It seems to be associated with syphilis more than any other factor, but circulatory stasis, trauma and nonspecific infections are contributing if not the main factors in some cases. There is no way of making a clinical diagnosis. [Author's abstract.]

Claude, H., and Schaeffer, H. DIABETES WITH MULTIGLANDULAR LESIONS. [Bull. d. l. Soc. Méd. d. Hôp., Oct. 13, 1922, XLVI, No. 27.]

Lesions in the pancreas, pituitary and suprarenals of an atrophic nature were found in this thirty-six-year-old diabetic after six years illness with final death by tuberculosis. The thyroid seemed approximately normal. The first symptoms of the diabetes developed with an accompanying acute nephritis of unknown pathogeny.

Greenthal, R. M. INCIDENCE OF THYMIC ENLARGEMENT WITHOUT SYMPTOMS IN INFANTS AND CHILDREN. [Am. Jl. of Dis. of Children, November, 1922, XXIV, No. 5.]

It is becoming more and more evident that large thymus glands are not the bugaboos previously thought, and this study of a series of 2,000

consecutive hospital admissions, shows that thymic enlargement was diagnosed in ninety, or 4.5 per cent of the cases. Eighty-seven of these presented no symptoms of thymic involvement. Enlargement of the thymus was noted in 25.6 per cent of all the patients who had a roentgenogram of the thorax made. Greenthal says that patients with congenital defects and malformations are more apt to have thymic enlargement than are other patients. It is possible that the mortality rate among surgical cases was lowered by preoperative thymic treatment. It would seem advisable to give thymic treatment to persons with thymic enlargement, even though they have no clinical evidence of thymic hyperplasia.

Pulawski, A. THYMIC DEATH IN YOUNG WOMAN. [Rev. d. Méd., 1922, XXXIü, No. 8-9.]

A clinical record of a twenty-nine-year-old woman who died after a severe emotional crisis induced by a quarrel with her fiancé. She went to sleep, was quiet, and suddenly died. Autopsy showed a large thymus (47 gm.) and hyperplasia throughout the lymphatic system. The whole brain seemed swollen.

Timme, Walter. EVOLUTION FROM STATUS THYMICOLYMPHATICUS. [New York Medical Journal, July 6, 1921.]

Timme outlines the signs and symptoms necessary to the recognition of status thymicolymphaticus and traces the various stages these individuals undergo between childhood and maturity. Briefly summarized the author gives the signs of this condition as follows: skeletal disproportion, *i.e.*, legs too long for the torso; maxillary torus; large central incisors and incisorlike canines; hyperextensibility of the joints; smooth, velvety skin and peaches and cream complexion; scant body hair; scrotal fold surrounding the base of the penis and frequently undescended testes; in the female an enlarged clitoris; enlargement and persistence of the thymus gland as revealed by percussion and X-ray; small blood vessels and a small heart; a tendency to visceroptosis. The distinctive laboratory findings are a relative lymphocytosis, low blood sugar, low carbon-dioxide tension and prolonged coagulation time. Symptomatically these patients show a tendency to nosebleeds, urticaria, asthma, hay fever and enuresis. They are subject to fatigue and dyspnea on exertion; fainting attacks and collapse in difficult situations; syncope and death in narcosis, fright and exhaustive demands. The blood pressure and pulse pressure are both usually low. From the numerous cases that have come under his observation Timme concludes that contrary to the popular concept most of these cases do not die young, but progress through various modifying stages to adult life. In explanation of this he postulates a thymus-suprarenal-pituitary compensatory syndrome (Timme, *Endocrinology*, July-September, 1918, vol. 2). In other words the author believes that hyperactivity of the suprarenal and pituitary glands in these cases overcomes the effects

of the hypoplastic conditions and the individuals so compensated for are to all intents and purposes normal save for a few stigmata of the early thymic state which makes their recognition possible. Other cases show varying degrees of compensation and it is with these individuals that the physicians have to deal. Timme believes that death in these thymic cases is not usually due to the mechanical effect of an enlarged gland but rather to the sudden exhaustion of the suprarenal secretion already greatly overtaxed in an effort to counteract the effects of the thymic state. The white Sargent line is frequently observed in these individuals. The fact that certain compensated cases show unmistakable acromegalic features, with an enlarged and eroded sella turcica is used to support the author's contention that the pituitary plays a compensatory rôle in this condition. The size and shape of the sella turcica as revealed by X-ray, Timme considers of great prognostic value. Those cases which show a small pituitary fossa, bridged over by clinoids in which obviously the pituitary gland has little room to expand, usually continue to evidence all the symptoms outlined above. Timme makes four evolutionary periods which he outlines as follows: first, the actual status of origin; second, the period of beginning compensation with rapid growth, bitemporal headaches and symptoms both psychical and physical of an underdeveloped pituitary body; third, the period of enlargement of the sella turcica with a gradually decreasing fatigue, decreasing headaches, and a slowing down of growth; fourth, the terminal period, in which the condition becomes fully compensated, with cessation of growth and headache, and much moderation of fatigue.

The author gives in some detail the therapy of the various phases of this condition. The administration of pituitary gland in several of its various forms proved the most efficacious opotherapeutic agent and gave very satisfactory results. Timme concludes his article with the following admonition. "These patients should not subject themselves to: 1, exercise, especially of a competitive nature, except in extreme moderation; 2, cold water bathing; 3, excessive ingestion of carbohydrates; 4, too intense application to any one task for a considerable period; 5, worry, anger, or emotional strain; 6, narcosis, especially chloroform, cocaine or its derivatives." [Author's abstract.]

Timme, W. COMPENSATORY MECHANISM IN STATUS THYMICOLYMPHATICUS. [N. Y. State J. of Medicine, XXII, No. 9, p. 404. J. A. M. A.]

There is abundant evidence, in Timme's opinion, that cases of status thymicolymphaticus undergo a gradual change through one of several decades leading finally to a more or less adequate state which enables the patient to take his place as a competent unit among his fellows. The enabling mechanism is composed of several component glandular organs, chief among which are probably the thyroid and the pituitary. Anywhere

in the course of the compensation, cessation of the process may take place, leaving the patient only partly efficient, giving signs of symptoms of the deficiency of the particular gland or glands involved. If this is properly recognized, a method of assisting the compensatory progress suggests itself. It is, furthermore, of the greatest importance to recognize the signs and symptoms of the overactivity of the connecting mechanism so that they be not treated as pertaining to a disease process but to a defensive one.

Leupold, E. SIGNIFICANCE OF THE THYMUS IN THE DEVELOPMENT OF THE MALE GENERATIVE GLANDS. [Beitr. z. path. Anat., 1920, LXVII, No. 3.]

Leupold's investigations establish certain striking relations between the grade of development of the thymus and that of the testicles. He states as a rule that a large thymus at the beginning of puberty is accompanied by large testicles. Yet the thymus may have suffered premature pathological involution and at the same time the adrenal may be hypoplastic. If the latter is true while the thymus remains well developed the testicles will still be small. Microscopic investigation shows that the development of the testicles parallels the richness of the parenchyma of the thymus. Underdeveloped testicles are found only in true status thymicolymphaticus. The writer's conclusions are that atrophy of the testicles depends upon atrophy of the thymus. He believes that after birth the thymus causes the testicles to mature in this way exercising its influence upon their development. Therefore marked pathological involution of the thymus results in interference in the development of the testicles. Furthermore apparently the thymus works indirectly through the adrenals since hypoplasia in them is accompanied by hypoplasia in the testicles. [J.]

Bircher, E. THE PATHOLOGY OF THE THYMUS. THE SURGICAL TREATMENT OF THYMIC ASTHMA AND THE IMPORTANCE OF THE THYMUS IN SURGICAL INFECTIONS. (Deutsche Ztschr. f. Chir., 1922, CLXXVI, 362. Med. Sc.)

The results of postmortem examinations on surgical cases during the previous three years showed a status lymphaticus present in 40 cases, 32 of which had been operated upon and 8 died without operation; of the total 28 were of an infective nature, such as diphtheria, tetanus, acute appendicitis, and cholecystitis (the anesthetic used in the operation cases is not stated). The rest of the article is taken up with cases in which the presumption was that the thymus was pressing on the trachea; they are divided into three groups; the first consists of 10 cases of thymic asthma in children of ages from 1½ to 11 years, who had attacks of dyspnea which in some cases could be brought on by extension of the neck. The greater part of the thymus, up to 45 gms., was removed in

these cases, and, except for one case which died suddenly half an hour after the operation, all were cured; the case that died showed considerable compression of the trachea from before backwards. In the second group are four cases in which tracheotomy was done urgently for supposed laryngeal diphtheria, but in which this diagnosis was eventually found to be incorrect; the thymus was large in all cases and in three some of it was removed; two of the cases died, one suddenly fourteen days after the operation and the other of pneumonia. The third group consists of seven cases of verified laryngeal diphtheria in which, in addition to tracheotomy, partial thymectomy was carried out; only two died, and the author holds that the removal of the thymus was the determining factor in obtaining so low a mortality, but it is doubtful whether such a deduction should be made from such a small series of cases. The histology of the thymus removed showed in all cases a hyperplasia of the medulla; the Hassall's corpuscles were diminished in number but increased in size.

Hammar. FUNCTION OF THE THYMUS. [Ups. Läk. För., Aug. 5, 1922, XXVII, No. 34. J. A. M. A.]

This is Hammar's twenty-seventh publication on the thymus gland. For more than twenty years he has made a special study of this organ, investigating the thymus in nearly 300 normal and nearly 500 pathologic cases. He says that the Hassall corpuscles seem to represent the essential functional changes, and form the morphologic expression of antitoxic activity. None of the evidence as to an internal secretion from the thymus is conclusive. All the changes that have been observed after thymectomy can be explained as the result of injuries of a toxic nature, which are neutralized in the intact animal. His research has apparently demonstrated that the thymus is not a transitory organ but functions up to old age. At puberty, its parenchyma begins to be reduced but this age involution does not check the antitoxic action of the thymus. His microscopic analysis of thirty-seven cases of sudden death of children from internal causes, which might be classed as "thymus deaths," showed that the thymus was of normal size and apparently of normal structure in all but five. The article is in English, and Hammar gives thirteen pages of bibliographic references and urges further research on the factors that stimulate and depress the formation of Hassall's corpuscles and the lymphocytosis in the thymus. For this, he says, we need a more extensive knowledge of other endocrine organs and of the real lymphoid tissue. The thymus is never found normal after death from disease or in extreme inanition. Roentgen irradiation disintegrates the lymphocytes, and the thymus is changed in this way to be a purely epithelial organ for a time.

Bonilla, E. EXISTING VIEWS OF THYMIC FUNCTION. [La Medicina Ibero, Feb. 25, 1922.]

The author begins with a description of the histology of the thymus as at present known, then enters into a brief but excellent summary of

the views of a great number of recent investigators as to the function of the thymus. The enumeration fully justifies his concluding paragraph: "As may be seen from this review, we know nothing certain about the physiology of the thymus, nor whether it ought to be included or not among the glands of internal secretion, for modern investigations do not seem to demonstrate the absence of an endocrine function with any such degree of definiteness as American authors do."

Akagi, Y. THE NERVES AND THEIR ENDINGS IN THE HUMAN GONADS. [Frankf. Zeit. f. Pathologie, XXVI, No. 1.]

The author after a study by newer histological methods shows that the vessels, unstriated musculature and capillaries, as well as all of the cells of the testicular stroma have an abundant nerve supply, the stroma cells being rich in receptor and effector endings. The interstitial glandular cells, the hyperplastic theca interna of the atretic follicles and the theca interna of the ordinary follicles are rich in nerve supply of a surprisingly abundant character. The primary sperma cells are completely surrounded by nerve end fibrils, as are also the interstitial cells of Leydig although the latter seem less abundant.

The terminal formations of the vegetative nerves of the ovary are rich and are either sharp or button-shaped; at times they are punctiform. A ganglion-like collection of nerve cells is found at the hilum. The corpus luteum is richly supplied as well although the so-called spurious corpora lutei are apparently free from the characteristic nerve end formations. [J.]

Graves, W. P. OVARIAN FUNCTION. [Am. Journal of Obstetrics and Gynecology, III, No. 6, p. 583.]

Ovarian therapy the author states in this purely clinical paper is valuable in treating the hot flushes of the menopause whether induced or biological. It has an uncertain but nevertheless unequivocal effect on certain dysmenorrheas. Amenorrhea, clotting, delayed menses, menstrual headaches, etc., are also at times advantageously treated by ovarian extracts. It may stimulate fertility. The action of ovarian extract, however, is uncertain and excepting in occasional brilliant instances rather feeble. The influence of ovarian substance on the rest of the bodily organism is not striking.

Rojas, Uerio. PRECOCIOUS HYPERGENITALISM. [Rev. d. l. Asoc. Méd., Ag., May and June, 1922, XXXV, No. 211-212.]

In this clinical record puberty appeared at the age of six or seven. It was as in the average boy of thirteen or fifteen. The boy was also precocious mentally. At nine he was 1.5 meters tall, but of an achondroplasia type, and he stopped growing for four years. Then under two months of combined thyroid, thymus, pituitary and suprarenal treatment

he gained 1.5 cm. in height. Rojas ascribes the condition to simple hypertrophy of the testicle. No tumor or other anomaly was discovered.

Dalché. VICARIOUS MENSTRUATION. [Progres Méd., Dec. 23, 1922, XXXVII, No. 52.]

The author here attributes bleeding from different organs at the time of menstruation to complex endocrine and neurotic disturbances.

Wollenberg, R. ROENTGEN STERILIZATION AND EROTICISM. [Arch. f. Psych. u. Nervkr., Vol. LXVI, Nos. 3, 4, 1922.]

Wollenberg refers to the fact that woman in contrast to the female of lower mammals is not dependent chiefly upon the function of the sexual glands for the impulse to sexual activity, but that cerebral influences are quite essential. Therefore roentgen castration can be expected to have a favorable influence upon pathologically increased and depraved eroticism only when through anamnesis and observation of the individual case a periodicity of the erotic overexcitement is shown to exist parallel with the cyclic ovarian function.

II. SENSORI-MOTOR NEUROLOGY.

1. CRANIAL NERVES.

Byer, W. G. M. INTERMITTENT EXOPHTHALMOS. [Arch. of Ophth., November, 1921.]

A married woman complained that on stooping or lying on the right side her right eye bulged forward. The patient was otherwise a healthy woman. The right eye in the upright position was sunken. Following stooping, pressure on the internal jugular, turning the head to the left or to the right, throwing the head well back, holding the breath after forced expiration, the eye bulged to a varying degree, even as much as twenty-five millimeters. There was no limitation of movement of the globe. The fundus was markedly congested and the disc abnormally vascularized. The author concludes that there was a varicose condition of the orbital veins, supposedly of congenital origin; there was inadequate collateral drainage. A skiagram showed the presence of a supernumerary cervical rib, which may have had some bearing on the jugular constriction.

Wright, W. W. LIVING SUTURES IN PTOSIS OPERATION. [Arch. of Ophth., March, 1922.]

W. W. Wright describes the use of sutures of fascia lata in the operation for ptosis. An incision, twelve and a half centimeters (five inches) in length, is made over the outer side of the thigh and the fascia lata exposed and cleaned. Two parallel incisions are then made in the fascia four to five millimeters apart and the strip freed from the muscle. Before cutting the extremities it should be split longitudinally to form the two

sutures required. They are threaded at both ends on curved needles and fixed firmly with silk. The horn spatula is placed under the upper lid and two small punctured wounds are made through the skin about ten millimeters apart and six millimeters above the lid margin. A transverse incision ten millimeters long is made over the brow. A needle is inserted into one puncture and passed subcutaneously in a transverse direction, to emerge at the other puncture. Each needle is then passed vertically under the skin of the lid, to emerge at each extremity of the brow incision. Two such sutures are inserted in the lid. The ends of the sutures are now drawn on until the lid is raised to the desired height and then tied in the transverse wounds. The knot should be reinforced by a catgut ligature. The author adopted this procedure with the lid of a boy. A good degree of motility subsequently resulted.

Coughlin. PERMANENT CURE FOR TRIGEMINAL NEURALGIA. [Missouri Med. Assn. Journ., October, 1922, XIX, No. 10; J. A. M. A.]

Coughlin operates under local anesthesia. The incision is linear, extending from the zygoma about a thumb's breadth in front of the ear backward and upward to the parietal eminence. This line is infiltrated with 0.5 per cent procain, all of the tissues are flooded, including the periosteum, then on either side of the lower end of this line the tissues are similarly flooded; the incision exposes the fibers of the temporal muscle, the temporal fascia is divided at its attachment to the zygoma, both layers, so that it can be drawn forward and backward with ease. The muscle is split and retracted to expose the underlying bone. The periosteum is scraped back, the bone drilled about an inch above the base line, the opening is enlarged with rongeur, the dura is pushed upward, exposing the floor of the middle fossa. The middle meningeal artery is tied and cut and almost at once the third division is seen entering the foramen ovale; the dura covering it is incised and the root is traced upward and backward, exposing the ganglion. The dura is elevated from the ganglion, continuing backward and upward and soon the root is seen entering the ganglion just above the apex of the petrous portion of the temporal bone, where it can be easily cut or evulsed. The wound is closed, usually with a small drain. This drain is removed at the end of twenty-four hours. Generally, for the first few hours there is considerable discharge of cerebrospinal fluid. The result is the permanent cure of the disease. Since writing this description Coughlin has been saving the motor root and is surprised to note that no facial nerve palsy has appeared in any case in which the motor root has been preserved.

Gravier, L. SUPERIOR MAXILLARY ZONA WITH FACIAL PALSY. [Lyon Médical, CXXXI, Oct. 10, 1922, p. 853.]

Gravier has shown a case of superior maxillary zona with facial paralysis in a man of thirty-two, who was seen by him on the third day.

There was then a right facial palsy, of peripheral type, with a herpetic eruption on the right upper lip and right half of the palate which stopped precisely at the middle line. There was no vesicular eruption in any other part of the area of the superior maxillary nerve, but papules were present in that of the right infraorbital nerve. There was an entire absence of any auditory symptoms, and there was no eruption in the cutaneous area ascribed to the geniculate ganglion. [Leonard J. Kidd, London, England.]

Neve. PARALYSIS OF FACIAL NERVE WITH HERPES ZOSTER. [Brit. Med. Journ., Oct. 7, 1922, II, No. 3223.]

Herpes zoster affecting the geniculate ganglion is a much more frequent cause of facial paralysis than is commonly supposed, and that many, if not all, the cases in which exposure to cold is blamed are due in reality to that microorganism, at present unknown, which, attacking the posterior root ganglia of the spinal nerves, and the homologous ganglia of the cranial nerves, produces the interesting train of symptoms called herpes zoster.

Jalcowitz, A. PERIPHERAL FACIAL PARALYSIS. [Jhb. f. Psych. u. Neur., Vol. XL, Nos. 2, 3.]

The author has observed twenty-six cases of peripheral facial paralysis. In one of these he observed for the first time involvement of trigeminal fibers with failure of the corneal reflex. This among other things leads him to believe that in many cases at least the lesion may be entirely peripheral. More than half of the cases gave clear evidence of disturbance of the lacrimal secretion but disturbances of salivary and sweat secretion could never be demonstrated.

Roasenda, G. TASTE TESTS IN FACIAL PARALYSIS. [Policlinico, Sept. 1, 1922, XXIX, Med. Lect. No. 9.]

The sensation induced in the tongue when a continuous current is sent from the sternum to the back of the neck is of value in diagnosis, according to this study. The sensation is bilateral in the healthy individual, but it is absent on the side of facial paralysis. The location of the gap, as the electrode is moved up the spine, helps to locate the lesion.

Worms, G., and de Lavergne, V. HERPES ZOSTER AND FACIAL PARALYSIS. [Paris Médical, Vol. XII, No. 23, p. 481.]

Many instances of facial paralysis are due to herpes zoster which is not diagnosed. The herpes zoster infection affecting the geniculate ganglion may induce a number of clinical pictures, from the complete geniculate syndrome to almost pure facial paralysis. The lumbar puncture fluid generally shows lymphocytosis and high albumin and sugar content in herpes zoster.

Colledge, Lionel. FACIO-HYPO-GLOSSAL ANASTOMOSIS. [Proceedings of the Royal Society of Med., August, 1922.]

Colledge records the case of a girl, aged sixteen, with right-sided facial paralysis persisting six months after operation on the mastoid and labyrinth. Reaction of degeneration was present. The hypoglossal nerve was divided and the central end anastomosed to the peripheral end of the facial. The peripheral end of the hypoglossal was anastomosed to a slip from the spinal accessory. Six months later tone had returned to the facial muscles at rest and movements of the tongue were associated with movements of the right half of the face, but there was dissociated voluntary control of that side of the face.

2. PERIPHERAL NERVES.

Bourguignon, G. ELECTRICAL METHODS IN THE DIAGNOSIS AND PROGNOSIS OF PARALYSIS DUE TO NERVE LESIONS. [Jl. d. Rad. d'Elect., VI, p. 565, B. M. J.]

G. Bourguignon has devised an apparatus whereby the chronaxie (the duration of passage of a constant current, of abrupt start, with which to stimulate any particular muscle) of nerves and muscles may be measured indirectly by means of condensers. He claims that this method is much more rapid than the direct measurement with currents of known duration. He has in this way measured the chronaxie of all the skeletal muscles, and finds that: (1) The proximal muscles of the limbs have the shortest chronaxie, the extensors of the fingers and the plantar flexors of the foot and toes having the longest chronaxie. (2) Muscles which act against gravity in the erect position of the body have a shorter chronaxie than those which act with gravity. (3) Synergic muscles—those acting together to produce a movement, as, for example, extensor carpi radialis and flexor longus digitorum—have the same chronaxie. (4) The chronaxie of a muscle and of its nerve must be closely related. If the chronaxie of the muscle becomes unduly long, even if the nerve is intact, the muscle is paralyzed. (5) When a muscle is paralyzed by a lesion of its nerve its chronaxie lengthens gradually; as the nerve regenerates the chronaxie shortens until it returns to normal. (6) In the absence of an apparatus for measuring chronaxie, muscles should be tested with the galvanic current only. The exact duration and strength of each induction shock being unknown, the faradic current gives very uncertain results. (7) Examinations for polar inversion should be discarded. On “making” a current the negative pole alone stimulates; on “breaking” the current, the positive pole alone. The appearance of polar inversion therefore depends on whether the stimulating pole is in relation to nerve or muscle. (8) The “reaction of degeneration” is present when (a) there is no contraction of the muscle on stimulating its nerve by a strong current (at least 15 milliampères), and (b) when similar contrac-

tions result from stimulating the motor point and from longitudinal stimulation of the muscle.

De Gaetano, L. TENDON TRANSPLANTS FOR RADIAL PARALYSIS. [Ann. Italiani di Chir., I, No. 2-3, p. 182.]

A paper on surgical technic demonstrating two cases in which complete success was realized by tendon transplantation. He makes three incisions, one in the middle third of the forearm, the others on the dorsal and palmar aspect of the wrist. He also in addition to the transplanting shortens the extensor pollicis longus by suturing a fold in it, through the dorsal incision. He draws the tendons up through the palmar incision, and fastens them to the extensors, shortening if necessary. Later there is much muscle training to be followed out and people with low grade intelligence are unsatisfactory patients.

Léri, A., and Breitel. POLYNEURITIS DUE TO TETRACHLORETHANE. [Bull. d. l. Soc. Méd. d. Hôp., Oct. 27, 1922, XLVI, No. 29.]

Two cases of polyneuritis of long duration due to tetrachlorethane are here described. Involvement of the interossei of the feet and hands with pain and loss of power are reported.

Wilson, Geo. THE DIFFERENTIAL DIAGNOSIS OF NEURITIS AND CONDITIONS SIMULATING IT, WITH SPECIAL REFERENCE TO POSTINFLUENZAL MULTIPLE NEURITIS AND ATAXIA. [J. A. M. A., May 19, 1923.]

Two cases are here reported which represent an unusual form of multiple neuritis in which ataxia and a loss of deep sensibility are prominent physical findings. In the first case, a diagnosis of tabes dorsalis had been made by some one else, although this diagnosis was untenable because of the rapidity of the onset, the absence of shooting pains, sphincter disturbance, and eye signs, the presence of normal reactions of the blood and spinal fluid, and because of marked weakness, which is not a symptom of tabes dorsalis. The history of the onset coming closely after an attack of influenza makes a diagnosis of postinfluenzal multiple neuritis and ataxia a likely one. The second case, similar in a great many respects to the first, also developed on the heels of an attack of influenza and showed much the same clinical picture. Wilson says that it is extremely unusual in a case of multiple neuritis for the sense of position and the sense of vibration to be lost, with relatively little involvement of the other forms of sensation. This naturally suggests the possibility of posterior columns of the cord being involved, as well as the peripheral nerves. The resemblance of this sensory loss to that occurring in the cord changes seen in the course of severe anemia is very striking, but the absence of pyramidal tract symptoms and the presence of normal blood and normal gastric contents rule out such a possibility. The diagnosis made in these two cases, therefore, was postinfluenzal multiple neuritis, with a possibility of involvement of the posterior columns of the cord as

well as of the peripheral nerves. Both patients are rapidly improving. Each should make a complete recovery.

Clarke, L. B. CLASSIFICATION OF BIRTH PARALYSES AS ENDOCRINES. [Southern Medical Journal, July, 1922, p. 534.]

The author makes the suggestion that many cases in which mental or physical deficiency and birth paralysis coexist may be complicated or caused by endocrinopathies. Careful analysis of this factor is desirable.

Bum, A. TREATMENT OF SCIATICA BY INJECTIONS. [Wien. klin. Woch., Oct. 12, 1922, XXXV, No. 41.]

This author injects rapidly into the perineurium 120 to 150 c.c. of a solution containing 0.7 per cent sodium chlorid and 0.07 to 0.1 per cent of calcium chlorid. The favorable results are due to purely mechanical actions he believes, hence he utilizes inert substances.

Brian, S. Libarona. SCIATICA FROM INHERITED SYPHILIS. [Prensa Méd. Arg., Jan. 20, 1923. J. A. M. A.]

The man, aged 36, had complained for twelve years of intermittent pain and tenderness in the fifth lumbar vertebra, the pain spreading to the groin and scrotum and to the right sciatic domain and becoming continuous. For twenty years, bending and flexing the lumbar spine had been painful or impossible. Rheumatism seldom affects one joint alone, and an infectious process in the vertebra would probably have spread during this long period. The disturbances were ascribed to kidney disease by three consultants. There was nothing to suggest syphilis in the family, but under tentative treatment for syphilis all the pains permanently disappeared.

Bourguignon, G. THE CHRONAXIES OF THE SPINAL SENSORY NERVES OF THE UPPER EXTREMITY IN MAN. [J. de radiol. et d'électrol., 1922, VI, 535, Med. Sc.]

The author gives reasons for abandoning the attempt to determine the chronaxy of sensory nerves by the stimulation of sensory nerve-endings in the skin. In taking it up again, he hoped to be able to use the sensation that produces stimulation of a sensory nerve, and shows the importance of the sensation being always produced at the same spot. The type of sensation and its mode of spread is described. By this method the author has studied the chronaxy of the spinal sensory nerves of the upper extremity. All the figures obtained agree, although obtained by two types of current. It was proved that the chronaxy of the sensory nerves is the same as that of the underlying muscles. It was also discovered that there is a small sensory nerve to the insertion of the supinator longus in the styloid process of the radius. The muscles supplied by the lower branches of the facial, by the median, and by the ulnar nerves have the same chronaxy as the sensory nerves of the palm. The

conclusions arrived at are as follows: in the arm there are four groups of sensory chronaxies, just as there are four motor, these are equal for the same region; (2) this association explains in part certain reflexes; (3) the results support the theory of Lopicque on the elementary nervous function.

Poiret-Delpech. TREATMENT OF HERPES ZOSTER. [Bull. Soc. d. Ther., Jan. 10, 1923, p. 25.]

The author reports on a method first advocated by Debove for the treatment of herpes zoster. Five grams of picric acid are dissolved in fifty grams each of absolute alcohol and sulphuric ether, and the solution applied every two days and covered with absorbent cotton. Internal treatment consisted in administration of one or two grams of antipyrin according to the severity of the pain. As a rule the pain diminished after the first application of the solution, and the vesicles began to dry up. In six of the eight cases reported upon a cure was obtained in three to six days, and in two severe cases in nine and twelve days respectively. It was never necessary to use more than five applications. As soon as the vesicles had desiccated and the pain had disappeared an inert powder such as talc or bismuth subnitrate was substituted for the picric acid solution. No relapses occurred. It is important to keep the solution far away from a flame, and not to throw the soiled dressings into the fire.

3. SPINAL CORD.

Sharp, Edward A., and Russell, Nelson G. BULBAR TYPE OF ACUTE POLIOMYELITIS. [Am. Neur. Assn., 48th Annual Meeting, May, 1922, Washington, D. C.]

A few cases of poliomyelitis have occurred in Buffalo each year since the epidemic of 1912. The frequency of the types have varied somewhat in different years, especially the very mild or aborted cases. Of the twenty-one cases observed during 1921 approximately one-half have been of the most severe type, comprising the Landry and the bulbar type. No aborted attacks were observed. Grouping the poliomyelitis cases in regard to the predominance of the lesions at various levels, constituting the different recognized types, it was found that eleven were of the spinal type, in which the extremities were first and most severely involved. In three of these some involvement of the bulbar or pontine nuclei was observed at some stage of the disease, but these bulbar and pontine symptoms occurring in the predominately spinal cases have not been a disturbing factor, and none have left permanent damage. Five of the twenty-one cases showed the Landry type of rapidly progressive paralysis, four of the ascending and one of the descending type. Three of these cases were fatal and had some involvement of the bulbar nuclei, shown in difficulty of deglutition, disturbance of the heart and respiratory apparatus

from lesions in the nuclei of the ninth and tenth cranial nerves. The other two recovered with considerable damage to the movements of the extremities. The remaining five cases represent the bulbar or the bulbar-pontine type, all of which were very severe and fatal. The symptoms were not confined to the bulbar nuclei but showed more or less extension to the spinal cord, although insignificant as compared to the bulbar symptoms. The salient features of the bulbar cases are shown in the report of two of the cases.

Case 1. Male child, four years old. Had been well, except for tonsillar infection with tonsillectomy, up to October 29, 1921. At this time there was a sudden appearance of vomiting with excessive secretion of saliva. The child had difficulty in talking, the voice was of the nasal quality, and there were frequent "choking spasms." A gradual increase in the severity of the symptoms occurred up to the third day, at which time there was difficulty in coughing and expelling mucus. Large quantities of mucus accumulated in the throat and produced the choking attacks in the effort to expel it. Mentally the child was alert and cooperated in every effort at examination. Frequently asked for water to drink, but had difficulty in swallowing as the fluid regurgitated through the nose and he choked as fluid entered the air passages. Examination of the throat showed paralysis of the palate. The posterior pharyngeal and palate muscles were completely paralyzed and the post-nasal space could not be closed off. Some function still remained in the anterior palate muscles, as in the effort to phonate the palate was drawn slightly forward. There was no noticeable disturbance in the movements of the face, tongue, or eyes. At this time all movements of the extremities and of the intercostal muscles and the diaphragm appeared normal. The patellar and Achilles tendon reflexes were present and equal on the right and left. There was some stiffness of the neck and back on attempts to flex the spine. Flexion of the neck produced temporary disturbance of respiration, as there was a tendency to dyspnea or actual stoppage of respiration during the time the neck was held in the flexed position. This phenomenon has also been observed in a considerable number of cases of tuberculous meningitis and of meningococcus infection, and is probably due to increased bulbar pressure through the cerebrospinal fluid. On the next day the bulbar symptoms became more severe. Swallowing was very difficult and "choking spasms" more frequent. Later the tendon reflexes disappeared and some weakness of the extremities was noticed, although at no time did any complete loss occur. The cerebrospinal fluid was clear; the pressure increased and showed a cell count of 120, mostly lymphocytes. The fluid produced a prompt reduction of Fehling's solution. The child died on the fourth day of the illness from respiratory and cardiac paralysis. The autopsy performed by Dr. Benjamin Roman showed a peculiar swelling of the brain tissue. There was some hyperemia of the cortex; hyperemia of the gray matter of the cord on cross-

section; cloudiness of the spinal pia and of the leptomeninges around the brain stem. Microscopical examination of the central nervous system showed a distinct inflammation of the entire length of the spinal cord and of part of the medulla. There was a hemorrhage just beneath the ependyma of the fourth ventricle. Neuronophagia was not marked and there were no hemorrhages to be found anywhere within the spinal cord or medulla.

Case 2. Female, age ten years. Sudden onset of illness October 27, 1921, with severe and frequently repeated attacks of vomiting, but with no intestinal disturbances. Large quantities of mucus and saliva produced constant expectoration, and as much as four to six ounces were expelled in an hour. This severe sialorrhea persisted throughout the illness. The pulse and respiration became very rapid. Up to October 30th there was no involvement of the extremities. Then there was sudden loss of the tendon reflexes with weakness of extremities. Nystagmus in the vertical direction appeared and the child became comatose, with labored respiration and the lungs filled with râles. Lumbar puncture showed the cerebrospinal fluid under pressure; clear; cell count 125, mostly mononuclears with a few broken down polynuclear cells. No bacteria. Moderate increase in the amount of globulin and albumin. As the coma deepened the respiration and the pulse rate became more rapid, and the lungs partly edematous. The extremities were immobile but the intercostals and diaphragm were acting fairly well. Five hours later paralysis of the intercostals was observed. The breathing was entirely diaphragmatic, and the child was markedly cyanosed and unable to expel any mucus. At this stage injection of 1 mil of adrenalin solution 1:1000 intraspinally was followed by a prompt return of intercostal action and relief of the cyanosis. Several hours later the child was rolled over in bed. The lungs seemed full of fluid and the child could not breathe in the new position, although the intercostals and the diaphragm appeared to be active. It is probable that the change of position filled the only functioning part of the lungs with fluid and the child drowned in its own secretions. Autopsy performed after the body had been embalmed showed a slight clouding of the leptomeninges over the base of the brain and over the spinal cord. No hemorrhages in the brain or spinal cord. Microscopical examination showed inflammatory changes throughout the entire length of the spinal cord and medulla, most marked in the neighborhood of the anterior horn cells. The pia showed marked inflammatory involvement, the blood vessels of which were strongly infiltrated with round cells.

The other three bulbar cases showed practically the same pathological changes in the central nervous system and in the lymphatic hyperplasia. Extreme hyperplasia of the lymphadenoid tissue of the mouth and pharynx was found in all the cases. A remarkable feature of all these cases was the evidence or history of preceding tonsillar infection and tonsillectomy. It would seem that the most severe cases were those associated with a

chronic hyperplasia of the lymphoid structures. The absence of hemorrhagic exudates in these cases appears in contrast to the pathological changes found in former years where hemorrhages in the cord structure has been a common observation. The absence of marked neuronophagia is also in contrast to the frequent findings in poliomyelitis, and the entire group presents histologically many of the changes found in epidemic encephalitis. Anatomically, however, the changes are widespread throughout the entire length of the spinal cord, with comparatively slight involvement of the structures above the pons. From the study of epidemic encephalitis and epidemic poliomyelitis during the past few years it has been our observation that the region of the pons marks the neutral ground between these syndromes. Encephalitis occasionally invades the structures below the pons, while poliomyelitis attacks the structures up to the pons far more frequently than beyond this limit. While the general histological character of the lesions are remarkably similar and in both affections are widespread—far beyond the limits which might be inferred from the clinical signs—anatomically they can be considered as predominatingly encephalitic or poliomyelitic. Inoculation experiments would indicate that the infective agent is different in the two syndromes, one having a selective action for structures above the pons while the other attacks the bulbo-spinal portion of the central nervous system. [Author's abstract.]

4. MID-BRAIN.

Zimmerli, E. CONTRIBUTION TO THE SYMPTOMATOLOGY OF DISEASES OF THE CEREBELLUM. [*D. Zschr. f. Nervhkl.*, LXXVI, Nos. 5, 6.]

Zimmerli describes a case of cerebellar tumor which for the first half-year gave the picture of a chorea minor and then changed to that of cerebellar ataxia. A year and a quarter later the patient died with symptoms of brain pressure. Autopsy revealed a gliosarcoma of the cerebellum.

Carp, E. A. D. E. DEGENERATION IN THE CEREBRO-CEREBELLAR COÖRDINATION SYSTEM. [*Nederl. Tijdschrift voor Geneeskunde*, LXVII, 1923, Aug. 25, p. 848.]

Carp describes the clinical history of a case of degeneration in the cerebro-cerebellar coördination system and gives a pathological demonstration of another case. The first, a man of forty-seven, had had for three years difficulty in walking which gradually increased in severity up to his present wobbling, uncertain gait. He stands with legs apart, oscillating round his center of gravity so that he is in danger of falling, an ataxy of cerebellar type. Soon afterwards ataxy appeared in the arms: often misses objects. The disturbance of coördination finally extended to the speech movements: very indistinct, badly articulated, and explosive.

His very emotional condition gives rise to scolding attacks of short duration, his mood mostly one of excitement: no trace of dementia. He executes the financial part of his business with great accuracy; but his writing has become almost illegible owing to tremors and shocks. He has no affection of micturition. Alcoholism only moderate now. No nystagmus, labyrinths normal. On account of the normal fundi and abdominal reflexes and the absence of spasticity one may exclude sclerosis multiplex. The possibility is that a degeneration has here developed such as Dejerine and Thomas describe as olivo-pontocerebellar atrophy. The pathological sections shown come from a man whose symptoms suggested pseudobulbar palsy. Necropsy revealed a greatly diminished cerebellum and a small pons, and a flattening of the olives. There was also a notable smallness of the frontal and temporal convolutions that in some places were sunken in. There was an almost complete degeneration of the temporo-pontine and prono-pontine paths. There was loss of all the pontine nuclei, including the nuclei arciformes: the olives, accessory olives, nuclei laterales medullae oblongatae, and the striae of Piccolomini are degenerated. The lost ganglion-cells are replaced by numerous small glial elements. There is no damage to the spinal cord paths nor to the radiations of the vestibular nerve. On the outer side of the olive is visible an ascending degeneration that possibly depends on a degeneration of Bechterew's thalamo-olivary path. There is a narrowing of the cerebellar convolutions. There is a loss of fibers in the vermis as well as in the cerebellar hemispheres. The flocculus also is affected, possibly owing to loss of cells in the dorsal accessory olive and the striae medullares. The loss of cells is greatest in the most lateral parts of the cerebellum, and becomes less more medially. The Purkinje cells have suffered: many show vacuoles, disposal of their Nissl-bodies, and alterations of shape, while in Bielschowsky preparations empty baskets show loss of Purkinje cells, and one sees swelling and shrivelling of their processes. [Leonard J. Kidd, London, England.]

Rossi, G., et Simonelli, G. EXPERIMENTAL RESEARCHES AND THEORETICAL CONSIDERATIONS ON THE FUNCTIONS OF THE CEREBELLUM. [Arch. Suisses de neurol. et psychiat., 1923, XII, No. 28. Med. Sc.]

The authors, who have themselves made considerable contributions to the subject, review the literature on the physiology and symptomatology of the cerebellum in the light of the researches of Sherrington and Magnus on the nature and nervous regulation of muscle-tone (cf. Medical Science, 1921, V, 134). They conclude that the two fundamental defect symptoms are atonia (in the sense of loss of Sherrington's postural tone) and asthenia. Of particular interest are the observations of Rossi on the relations of cerebrum and cerebellum. He finds that while stimulation of the cortex of one cerebellar lateral lobe produces no direct motor result, yet it lowers the threshold of excitability of the crossed cerebral motor

cortex. This he regards as indicating a reinforcing action of the cerebellum upon cerebral cortical impulses. Further, he finds that after ablation of one lateral cerebellar lobe, the excitability of the crossed motor cortex is increased. It is not altogether clear why the authors should so sharply differentiate asthenia from atonia, for once we accept the notion of tone as the basis of posture, and as one of the two factors in the normal coördination of movement, it seems inevitable that the loss of this component must result in a diminution of force and in ready fatigue. Moreover, as Luciani pointed out, part of the symptomatology of cerebellar lesions depends upon the subject's efforts at correction. These involve the expenditure of more than normal force in the carrying out of any movement and are thus a factor in the production of asthenia. The reader will probably not always agree with the interpretation put upon the work of many of the authorities quoted by Rossi and Simonelli, nor with the evaluation of some of this work, but the article remains an interesting general discussion of modern notions on the cerebellum. [F. M. R. Walshe.]

Hellmann, K. ARM TONUS IN CEREBELLAR AFFECTIONS. [Klin. Woch., July 15, 1924. J. A. M. A.]

Hellmann recommends Wodak and Fischer's arm tonus reaction in diagnosis of cerebellar tumors. Vestibular stimuli cause a unilateral change in the sensation of gravity. This accounts for the lowering of one of the arms extended horizontally forward. The test should last as long as possible (fifteen minutes) or be repeated with short intervals of rest. The spontaneous reaction in Wodak's and the author's cases was not changed by vestibular stimuli.

5. PES; INTERBRAIN; THALAMUS; STRIATUM.

Hallervorden u. Spatz. UNUSUAL LESION OF THE EXTRAPYRAMIDAL MOTOR SYSTEM, WITH REFERENCE TO THE RELATIONSHIP BETWEEN GLOBUS PALLIDUS AND SUBSTANTIA NIGRA. [Zentralbl. f. d. ges. Neurol. u. Psychiat., 1922, XXVIII, 518.]

The authors report the pathological examination of the brain in a case of congenital imbecility, with generalized flexor contractures and choreo-athetotic movements. The patient died at the age of twenty-four. To the naked eye the brain was normal, except that the globus pallidus and substantia nigra on both sides were of a deep brown color. Microscopically, they found diffuse nerve cell and fiber changes throughout the brain. In addition, the following changes were found in the pigmented structures named above, and minutely confined to them: thickly scattered dark brown pigment granules (? within the nerve cells), which gave an intense iron reaction, but no calcium reaction, and also a smaller number of almost colorless granules which did not contain iron; numerous large glia

nuclei, which were not like those described by Alzheimer in pseudo-sclerosis.

The authors believe that this pigmentation is a pathological exaggeration of a condition normal to both globus pallidus and substantia nigra, but especially to the latter. It indicates a close physiological relationship between these structures. The pigment is a product of metabolism and they attribute its formation to the glia nuclei. They regard it not as hematogenous, but as autogenous. The blood vessels were normal, and the nerve cell changes were less marked in these ganglia than elsewhere in the brain.

They mention that the clinical picture observed during life corresponded to the pallidum syndrome of C. and O. Vogt. If the views of the Vogts be correct, this is what would have been expected, but it was not so, for choreoathetotic movements are described as being present, one of many indications of the caution necessary in accepting the theoretical conclusions of these observers. The liver was not examined in this case, but the authors believe that it did not belong to the group progressive lenticular degeneration pseudo-sclerosis, but approximated to C. and O. Vogt's status dysmyelinatus. The possibility that lesions of the substantia nigra may play a more important part in the production of the so-called corpus striatum syndromes than is generally supposed is mentioned. [F. M. R. Walshe.]

Pollak, E. CONTRIBUTION TO THE PATHOLOGY OF EXTRAPYRAMIDAL MOTOR DISTURBANCES (Wilsonian Lenticular Degeneration). [Zschr. f. d. ges. Neurologie und Psychiatrie, Vol. LXXVII.]

Pollak reports histological investigations in a case described by Gerstmann and Schilder and considered to be pseudo-sclerosis. His findings agree in general with those of Spielmeyer in similar cases. Yet he believes that vascular changes also play an important part in the injury. He found extensive changes in the cerebellum and severe injury of the cerebellar-frontal tract. He believes that careful investigation is needed in such cases, especially in the cerebellum. He does not believe that all the symptoms of the so-called striate syndrome are to be referred to changes in the striatum.

Spatz, H. DEMONSTRATION OF IRON IN THE BRAIN, ESPECIALLY IN THE CENTERS OF THE EXTRAPYRAMIDAL MOTOR SYSTEM. PART I. [Zschr. f. d. ges. Neurologie und Psychiatrie, Vol. LXXVII.]

Spatz reports an extended macroscopic and microscopic study of the iron content of the central nervous system by means of Berlin blue and sulphur-ammonium reactions. The relative strength of the reactions could be considered according to four groups as to locality and also in correspondence to ontogenetic development. The globus pallidus and the substantia nigra, which belong close together, showed the most intense

coloring, next the nucleus ruber, nucleus dentatus cerebelli, then the striatum. The cerebral cortex and other parts gave weak reactions; the spinal gray and the olive were examples of parts which manifested no reaction. The globus pallidus gave a clear reaction already in a one-half-year-old child but the fetus showed none anywhere. In a number of nurslings the reaction was present in the same order as in the adult but weaker in every part. The centers manifesting the reaction were those which control muscle tone.

The microscope demonstrated a diffuse reaction, chiefly probably an accumulation of iron in a high dispersion solution, then a fine granular deposit, especially in the neuroglia cells, probably an intravital one. Finally iron-containing pigment is found chiefly in the mesodermal elements, especially the perivascular. The iron outside the pigment is to be considered autogenous, not hematogenous. An increase of this specific brain iron was found in cases of extrapyramidal fixation. The increase of iron-containing pigment in the infiltrations in general paresis is to be considered as hematogenous. In this disease the striatum is apparently always attacked. There is no increase of the specific iron. Hemorrhage conditions intensive local reaction without influence of the specific iron. The specific iron, fine granular diffuse, is probably structural iron, oxygen carrier in cell respiration, while the iron-containing pigment is to be considered as product of degeneration.

Goldstein, K. ON THE ANATOMICAL LESIONS (ATROPHY OF SUBSTANTIA NIGRA) IN POST-ENCEPHALITIC PARKINSONISM. [Ztschr. f. d. ges. Neurol. u. Psych., 1922, LXXVI, 627; Med. Sc.]

In subacute and chronic cases of lethargic encephalitis, which have been characterized by a parkinsonian syndrome, with or without tremor, the substantia nigra is remarkably atrophic. The atrophy is due to the degeneration and total disappearance of a great number of nerve cells, the melanin granules of which are in part collected by macrophages and proliferated neuroglia cells, in part eliminated through the blood stream. [C. da Fano.]

Kirschbaum, W. THE INFLUENCE OF SEVERE AFFECTIONS OF THE LIVER UPON THE CENTRAL NERVOUS SYSTEM. COMMUNICATION I. FINDINGS IN THE BRAIN WITH ACUTE YELLOW ATROPHY OF THE LIVER. [Zschr. f. d. ges. Neurologie und Psychiatrie, Vol. LXXVII.]

The author reports changes observed in the entire brain in three cases of acute yellow atrophy of the liver. These seemed to be the result chiefly of the toxic substances which passed through the vessel walls. Neither were the striatum and pallidum predominantly affected nor did the type of histological changes show relation to those found in Wilson's disease or in pseudo-sclerosis.

6. ENCEPHALITIS.

Encephalitis in Brisbane and Ipswich. [Brit. Med. J1., 1922.]

We have received an account of an outbreak of encephalitis in Queensland. Seven children suffering from this condition were treated in the Hospital for Sick Children, Brisbane, while several patients were seen in Ipswich. It appears that the onset of the condition is sudden and is characterized by extreme drowsiness with fever. The temperature rises in the early stages to 38.5° C. to 39° C. (101° F. to 102° F.). The patients are constipated and the stools have usually a very offensive odor. There may be paresis of the ocular muscles; ptosis is common and divergent strabismus has been seen in three children. The thumbs are turned into the palms of the hands, with the fingers closed over the thumbs. Opisthotonos is usually present and may be extreme. As the disease progresses the temperature rises and may reach a high level, 40.5° C. or even higher. The drowsiness increases and may be so intense that the child cannot be aroused. Other children, when aroused, show signs of irritation; if permitted, they relapse into the state of stupor or apparent coma. Convulsions occur and are either unilateral or bilateral. They may last for a few seconds or for minutes and may be repeated at frequent intervals. There is a spastic condition of the limbs in all cases. In some children there has been incontinence of urine and in a few retention has been seen. Photophobia has proved to be a common sign.

Lumbar puncture has been carried out in many instances. The fluid is apparently normal. The pressure is either slightly increased or normal. No bacteria have been recovered by culture from the cerebrospinal fluid. Attempts to isolate a bacterium from the blood have also proved vain.

The duration of the disease appears to be variable. Death has occurred as early as seventeen hours after the onset of symptoms and as late as the sixth day of disease. No treatment appears to be of any avail. Respiratory failure was the most common immediate cause of death. Death has also occurred during convulsions. Recovery took place of an infant whose age is not given, an infant of six weeks, a boy aged two and a half years and a child aged six years. In the boy aged two and a half years there was complete paralysis of the limbs, lasting about four days. During the course of the following week he began to move his arms and legs. Three weeks after the onset he was able to walk. When recovery occurs, the temperature reaches the normal line on about the sixth day.

No information is available of the histological signs discovered after death.

Kling, C., Davide, H., and Liljenquist, F. THE VIRUS OF HERPES AND THE VIRUS OF ENCEPHALITIS. [C. R. Soc. Biologie, June 10, 1922, p. 79.]

This study advances certain criteria which militate against Levaditi's contention that the virus of herpes and the virus of encephalitis lethargica

are identical. Exact microscopical studies of the lesions produced in the brains of rabbits after intracerebral inoculation with each virus has been carried out and the two sets carefully compared. In the case of the herpetic virus a definite meningitis is found; there is an infiltration with large numbers of cells, of which the majority are mononuclears, though polymorphs are quite frequent. In the brain the main lesion is found in the cortex; not only are foci of cellular infiltration seen, but there is a diffuse inflammation throughout the cerebral tissue; polymorphonuclear leucocytes are abundant, and are often collected into small groups forming miniature abscesses. In the case of the encephalitic virus, on the other hand, the meningeal infiltration is less marked and is more or less limited to the area around the vessels; the cells, too, are mainly lymphocytes, no polymorphonuclears being seen. In the brain the cortex is generally exempt; it is the mesencephalon which is attacked. Here there are definite foci of inflammation, perivascular cuffs of cells, and striking alterations in the nerve cells themselves. The authors consider that the lesions produced by these two viruses are sufficiently distinct to preclude—or, at any rate, to form a contraindication to—their identity.

Rosenow, E. C., and Jackson, G. H., Jr. MICROSCOPIC DEMONSTRATION OF BACTERIA IN LESIONS OF EPIDEMIC ENCEPHALITIS. [Jl. of Infect. Dis., February, 1923, XXXII, No. 2.]

The presence of organisms in or adjacent to the lesions in a series of cases of encephalitis which occurred in widely separated communities, their absence in tissues free from changes, and in control sections from persons that died from other diseases, Rosenow and Jackson believe indicate causal relationship. The shape and grouping of, and the gradation between, large and small organisms, and the breaking of large forms into small bodies, indicate that the various forms are modifications of the same microorganism.

Truffi, M. ENCEPHALITIS IN THE RABBIT AFTER INOCULATION ON TO THE CORNEA OF THE VESICULAR FLUID OF HERPES ZOSTER. [Pathologica, 1922, XIV, 565.]

Meineri, P. A. ENCEPHALITIS IN THE GUINEA PIG FROM INTRACRANIAL INOCULATION OF THE VESICULAR CONTENTS OF HERPES ZOSTER. [Pathologica, 1922, XIV, 772. Med. Sc.]

The vesicular fluid of a recent case of herpes zoster was inoculated by Truffi on the scarified cornea of a rabbit. Two days afterwards an intense kerato-conjunctivitis of the inoculated eye was observed. Twenty-two days afterwards the animal showed nervous symptoms similar to those exhibited by rabbits inoculated with the virus of herpes febrilis. Ten days after the manifestation of these symptoms the animal was killed, and at the histological examination of part of the brain a moderate degree of congestion and some perivascular infiltrations with lymphocytes were

noticed in the neighborhood of the brain ventricles. The corneal inoculation of an emulsion of the rabbit's brain into two guinea pigs was not followed by any symptom of either local or general infection. Nervous troubles were also observed by Meineri in a guinea pig which had been inoculated subdurally with the vascular contents of a recent case of herpes zoster. The animal died seven days after the inoculation, and an emulsion from its brain was inoculated subdurally into four other guinea pigs. These died twenty-four hours afterwards. Further inoculations in other guinea pigs were attended by negative results. At the histopathological examination of the brain of the four guinea pigs which died twenty-four hours after the inoculation the author found lesions "similar to those described by Truffi." [C. Da Fano.]

7. TESTS, REFLEXES, SYMPTOMS.

Crouse, Hugh W. ROENTGEN RAY IN NEUROLOGICAL DIAGNOSIS; ITS SHORTCOMINGS AND POSSIBILITIES. [Am. Jl. of Roent. & Rad. Ther., June, 1923.]

The basis point of the paper is that many scientific factors correlatively arranged are needed in neurological diagnosis. That the X-ray is at present a very important part of such. The X-ray previous to Dandy's intraventricular and spinal subarachnoid injection of air was of direct aid in only eight per cent of central nervous system lesions. Calcareous degeneration within the skull, three per cent; osteophytes of the inner plate of the calvarium mainly located in the frontal area, tumors of the orbit, ethmoid, sphenoid or frontal sinus, dural growths producing thinning of the calvarium, two per cent; and hypophyseal tumors, three per cent, combined, gave the above percentage. The paper stresses the possibilities of Dandy's technique, but urges the need of a series of radiographs of the normal skull and spine. X-ray interpretations are frequently based upon an inadequate knowledge of normals. The author insists that the injection of air into the ventricles or spinal subarachnoid space is distinctly as yet the province of the neurological surgeon, not the roentgenologist. Radiological pathology is as distinct as macroscopical or microscopical structural changes. Correlative case history, other special men's findings, should be weighed by the radiologist before giving a radiological interpretation.

The author insists that roentgenologists are important correlative diagnosticians, not independent diagnostic autocrats. This latter position is mainly due to surgeons and physicians demanding of the X-ray man an independent diagnosis. Such a demand is uncalled for, unfair to the patient, and should be resented by the roentgenologist. The various endocrine, birth and accidental pathologies of the brain are scanned in the paper. The need of a soft tissue radiological technique is urged in children prematurely born; in those of primiparae approaching the end of the child-bearing period; and in instrumentally delivered or torsion

handled infants. The infant with a slow coagulating blood, a prolonged bleeding period, navel or intestinal hemorrhage symptoms, poor suckling, irregular breathing, a slit-like contracted pupil, dilated veins of the scalp, ecchymotic spots about temples or eyelids, should have a radiological study, in the opinion of the author. Spinal pathology, outside of Kummel's disease and acute accidental lesions, have a poor X-ray possible diagnostic angle. Malignant, syphilitic, tubercular or typhoidal spondylitis can be radiologically differentiated, if a correlative, careful case history is weighed when interpreting the X-ray plates. Brief descriptions of various neurological investigating angles are included in the paper. Barany's chair test, Leri's law, and the pathology of brain stem lesions are rapidly covered. The chief urge of the author throughout the paper is that the clinician and radiologist be constant consultants. [Author's abstract.]

Rossello, H. J. ELECTRIC PHENOMENA IN MUSCLES. [An. d. l. Fac. d. Med. d. Mont., April, 1923.]

Every muscle subjected to traction, even without excitation or contraction, generates electric phenomena. This is experimentally proven.

Landau, A. A TONIC STATIC REFLEX IN INFANTS. [Klin. Woch., July 2, 1923.]

When a lying prone infant is lifted up, it retains the lordosis and keeps its head high for from half a minute to two minutes. This reflex occurs in 50 per cent of the infants between six and eight months old, and disappears when the higher static faculties develop. It is especially pronounced in rachitic infants with flabby musculature. Passive flexion of the extended head instantly arrests the contraction of the dorsal muscles.

Ingvar, S. CENTRIFUGATION OF NERVOUS SYSTEM. [Am. Arch. Neur. & Psych., September, 1923. J. A. M. A.]

Ingvar asserts that prolonged intense centrifugation of living ganglion cells can bring about a separation of the cell constituents or an alteration of their mutual interrelations. This has a bearing on the effects of severe trauma, concussions and other physical forces on the nervous system. It supports strongly the assumption that direct cellular disturbances are the cause of many acute commotional symptoms. The part of the ganglion cell that can be moved most easily within the cell by centrifugation is the nucleolus. After a short centrifugation this is always thrown to the distal end of the nucleus and proves that this latter is a vesicle, the contents of which have a low viscosity. The next most conspicuous change after centrifugation consists in an accumulation of the chromatophil substances at the distal end of the cell, and proves that these bodies must exist in a fluid condition in the living cell. This accords with the observations on the living cell with the ultramicroscope. The canalicular apparatus is squeezed out of its position in the cell by centrifugation, but maintains its normal morphologic character; this demonstrates that the con-

tents of this apparatus do not mix with the chromatophil substances and that they probably have a high viscosity. The neurofibrils show less elasticity than surrounding constituents and can be separated from other parts of the cell. The whole net of neurofibrils loosens as a unit from the cell membrane and, when centrifugation has been sufficiently strong, occupies the center of the cell and encloses the nucleus. This, Ingvar asserts, proves that the doubts raised in modern histologic literature as to the neurofibrils are not justified; the neurofibrils exist in the living specimen and are not artefacts brought about by fixative agents.

Stenström, Nils. TREMOR. [Hygiea, 1923.]

A preliminary note on tremor, studied principally in cases of exophthalmic goiter. For purpose of analyzing the tremor, the shadow of a finger (magnification 1:1.5) was photographed on the falling plate of the camera otherwise used in the electrocardiograph. In all studied cases of exophthalmic goiter (forty-nine cases) tremor was present. The frequency was about 620 waves a minute individually varying with about 100 waves above or below this rate. The usual amplitude was between 1 and 2 mm. (T. with an amplitude of less than 0.5 mm. cannot be seen or surely felt.) In the majority of the cases the tremor was continuous. The waves mostly were found irregular in the same way as the waves of auricular fibrillation in the electrocardiogram. In recovery of the goiter the rate is apt to be reduced with some few per cent the amplitude is diminished and often the waves get more regular features. A tremor of similar outlines and rate as the goiter tremor can be induced in sound subjects by exhaustion of the finger muscles. The trembling of greater parts of the arms met with in certain nervous diseases as paralysis agitans is of the same aspect but takes place with a lower frequency (250-400) and can be imitated by exhaustion of the corresponding muscle masses. [Author's abstract.]

Grueter, H. A. EYELID REFLEX WITH BRAIN LESION. [Mit. a. d. Gren. de Med. u. Chir., 1923.]

The response to caloric or tactile irritation deep in the auditory canal was found to be normal in 148 persons with normal ears and nervous system. In two patients with old trauma of the skull the reflex was lacking. The findings in forty other persons show that a normal response does not exclude a brain lesion, but the negative reflex testifies certainly to injury of the brain.

Thiel, R. THE AQUEOUS HUMOR IN CENTRAL NERVOUS AFFECTIONS. [Klin. Woch., Nov. 26, 1923.]

When fluorescein-sodium is taken by the mouth, in healthy eyes it does not appear in the aqueous humor. In glaucoma, iritis, affections of the

ciliary body and with lowered tension of the eye the aqueous humor is tinted by it. In tabes, epidemic encephalitis, paresis, and retrobulbar neuritis it is present. From Kafka's studies on the choroid plexus and ciliary body their similarity in development offers some interpretations of the phenomena.

III. SYMBOLIC NEUROLOGY

1. PSYCHONEUROSES; PSYCHOLOGY.

Maeder, A. THE PHYSICIAN'S PERSONALITY AND PSYCHOTHERAPY. [Schw. med. Woch., May 22, 1924.]

Medicine has not escaped the blight of the mechanical trend in this age of machinery. Certain physicians are so blinded by the progress of diagnostic methods that they believe in isolated affections of the heart or of the stomach, and forget completely the other somatic and the psychic condition of the patient, which may be also responsible for the outbreak of the symptoms. The action of the personality of the physician is the central point of the art of medicine.

Abrams. THE CULT OF ABRAMS AND THE SCIENTIFIC AMERICAN. [J. A. M. A., Oct. 27, 1923.]

The "Electronic Reactions of Abrams" are being investigated by the Scientific American. While the Journal is still of the opinion, expressed several times, that the whole scheme is so preposterous a fake as to stand self-condemned, yet, there are, presumably, some people who demand demonstrable evidence of the fact that the moon is not, and never was, made of green cheese. A preliminary article regarding the investigation to be undertaken by the Scientific American appeared in the October, 1923, issue of that publication. The first test to determine the accuracy of the "Electronic Reactions" diagnosis is reported in detail by the managing editor of the Scientific American in the current (November) issue. It makes amusing reading. Six tubes of pure germ cultures were submitted to an Abrams disciple with the request that he identify the cultures. The first tube was a pure culture of typhoid. The Abramsite diagnosed it as "acquired syphilis, congenital syphilis, tuberculosis, gonorrhea, pneumococcus, malaria and influenza" but failed to diagnose typhoid. The second tube was a pure culture of pneumococcus. The "ERA" ("Electronic Reactions of Abrams") gentleman diagnosed the contents of this tube as "congenital syphilis, tuberculosis, gonorrhea, malaria, influenza and colon septicemia" but did not find what it really was, pneumococcus. The fourth was a tube containing a pure culture of tetanus. It was diagnosed as "malaria, influenza, colon septicemia and diphtheria," but not tetanus. The sixth culture was of diphtheria. The Abrams wizard found "congenital syphilis, tuberculosis, gonorrhea, pneumococcus, malaria and colon septicemia." And so it went. When the Abrams

disciple found that he was falling down hopelessly he began casting around for excuses. Looking at the vials which he had already tested, he discovered for the first time that the labels had red edges and bore blue handwriting. This catastrophic chromatic combination, naturally, shot the "ERA" all to pieces. The disciple explained how, quite recently, he had obtained very unsatisfactory results all one morning to find later that the cause was due to his "subject" (the healthy individual whose abdomen is percussed) having a piece of red cardboard, a theater seat check, in his trousers pocket. However, the Scientific American's committee removed the red bordered labels with the blue handwriting and substituted a set of plain labels prepared on the typewriter; but the diagnostic results were no more satisfactory than before. It may be said in closing that Albert Abrams has disowned the disciple who flunked the tests as not being a Simon Pure hundred percenter and has promised the Scientific American to give a personal demonstration "some time in the near future, if time permits." The whole thing is very funny and very foolish.

Winslow, Yvonne E. PSYCHOLOGY OF CHILDHOOD. [Inter. Zeit. f. Ind. Psych., January, 1924; B. M. J.]

Yvonne E. Winslow insists on the great importance of childhood influences, their effect on the ensuing adult life, and their ultimate influence on human happiness. Parents have to learn the importance of the study of their children's individuality, and must seek to encourage and develop this individuality rather than impress their own personality and authority on their children. "We have been hindering the young from a free and harmonious development of their natural powers to a complete and consistent whole, and this need not be." Children are shy and reticent, while parents too often forget their own experiences in childhood and fail to give encouragement to their children. Children are also very impressionable and do not for many years escape from the control of the opinions of their elders. They need to be removed from the "family psychology," as it is most important, in order to obtain a broad and sane outlook, that children should not develop their ideas entirely under family influence. The spoiled child is as striking an example of this error as is the repressed child. Few adults (the author argues) are aware how the sensitive and talented child suffers from being misunderstood, from injustice and unrecognized longings, and how dependent he is upon his elders' affections. Children of this kind often suffer mental and spiritual anguish because their emotions are much more developed than are their reasoning powers. For the same reasons they should be guarded against emotional strain and be protected from gruesome stories and pictures.

Nuttall, W. OCCUPATIONAL PSYCHOLOGY AND FATIGUE. [Inter. Zeit. f. Ind. Psych., January, 1924.]

Experimental research is of practical value in the study of occupational psychology, and more especially with regard to the choice of an occupa-

tion. Much has been accomplished in this way, but experimental tests and classification of reactions do not solve the problem completely. Even though these tests indicate an aptitude for a certain calling, it does not follow that the individual will do that work properly, nor that he will be happy in that occupation, nor that he will be able to obtain the particular work for which he appears to be suited. There is much latent talent in children which may be developed by encouragement, or checked by the failure of parents or teachers to discover its existence. Attention should be directed not only to choice of occupation but also to the individual's attitude towards work in general. There are many disillusioned individuals in the world to-day who make no attempt to follow their calling, and who furthermore discourage others. Nuttall concludes that it is highly important to encourage a courageous and adaptable outlook towards work; and that the problem of industrial fatigue is wider and deeper than consideration of physical environment in mills and workshops—it is a problem of conflict between the world outlook of the individual and that of the society into which he happens to be born.

Zeehandelaar, I. NEUROSES. [Ned. Tijd. v. Gen., April 14, 1923.]

This paper very sensibly contends that the question is not whether the affection is organic or functional, but, how much of it is organic or how much functional. The mercury lamp, oxygen and other physical measures are often valuable adjuvants, far better than drugs. As the hemoglobin percentage increases, the nervous asthma or other neurosis subsides more promptly under psychotherapy.

2. EPILEPSIES.

Thomson, J. PECULIAR FATAL CONVULSIONS IN FOUR CHILDREN WHOSE FATHER SUFFERED FROM LEAD POISONING. [Brit. Jl. Children's Dis., Oct.-Dec., 1923. J. A. M. A.]

The chief points of clinical interest in Thomson's case seem to be that all of the children born after the father's lead poisoning began were seriously affected, although the mother remained quite healthy. One patient, aged ten months, continued, until near the end, in excellent bodily and mental health—apart from fits; and showed no sign of rickets, indigestion, mental dullness or mental peculiarity. The fits first appeared at ten weeks. Death occurred at eighteen months.

Clark, L. Pierce. THE SURGICAL TREATMENT OF ORGANIC EPILEPSY. [Journal A. M. A., March 8, 1924.]

This well known student of epilepsy has gone over the histories of thirty cases; all but one were due to cranial trauma. In all instances the lesion induced was immediate and palpable. In general, surgical operation was undertaken soon after the injury. In the majority, the predominant symptom was convulsive, although minor symptoms of impaired physical

or mental functioning were also present. The convulsions were focal in character, or general with focal onset. In no instance did the lesion or site of injury really belie the clinical symptoms shown in the nature of convulsions, and so far as localization was concerned the injury or subsequent cerebral damage did not differ from that indicated by the clinical data. However, the clinical symptoms seemed to give no clue to the extent or degree of lesion. The operations invariably showed up lesions beyond repair. They ranged from extensive inflammatory thickening of the membranes and cortical tissues to that of deep injury, cysts or actual loss of cerebral substance. However, even trephin operations failed to disclose anywhere near the actual extent and degree of injury, as revealed at necropsy. Obviously, the seizures were not even checked for a time after operation. The degrees of injuries susceptible of necropsy analysis in twenty-one of the cases were of the following nature: injury to membranes only, two cases; injury to membranes and cortex, eight; injury to membranes, cortex and deeper parts of the brain, eleven. The lesions of the last group were most frequently conditions of cerebral softenings. Some of the lesions found at necropsy were evidently of too recent a character to have been either a part of the original trauma or of the operation directly as such. Clark summarizes as follows: Ordinary essential epilepsy is not operable. Operation on pure jacksonian epileptiform convulsions without loss of consciousness is to be undertaken only when spasm is definitely local or has a distinct and constant focal onset. Then, preferably when there is an after-defect of paresis or sensory loss which is more or less enduring, such operation belongs properly in the domain of brain surgery *per se*. Cases in which there are both grand mal and jacksonian attacks, with or without loss of consciousness, are operable only after the most careful estimate of the localizing symptoms and their clinical significance as to disease of brain structure. Often the cerebral lesions indicating symptomatic epilepsy are too remote or extensive for surgical removal. The greatest surgical care is necessary in handling the brain tissues, and this often applies to the membranes quite as specifically as to the cortical tissues themselves. Drainage disposal for the exudates already present or surgically induced must be properly met in every case. Cysts and adhesions are often prevented in this manner. Their absence lessens cortical irritation.

Ostheimer, A. J. CONVULSIVE SEIZURES IN SOLDIERS. [Arch. Neur. and Psych., Jan., 1924.]

Ostheimer has studied various types of convulsive seizures in ex-service men. He wants to confine the use of the term "epilepsy" to the syndrome characterizing convulsive attacks that have come to be known as "epileptic fits" only in case the pathogenesis is not known with any degree of exactness, namely, to the so-called cases of idiopathic epilepsy. The term epilepsy and a similar diagnosis should not be used in those cases in which exactly similar convulsive attacks occur but in which the

pathogenesis which includes psychogenesis is well or fairly well known. Under such a nosology, 40 per cent of his 241 cases fell under the heading epilepsy, while the other 60 per cent are due to congenital inferiority, hysteria, brain injuries and syphilis, endocrine disturbances, brain tumor, chronic heart disease, hystero-malingering, asthma, multiple sclerosis, chronic nephritis and gastro-intestinal disturbances. He considers the use of phenobarbital of great value in practically all cases of epilepsy, but that in the case of convulsive seizures, due to some known cause, it is a question whether phenobarbital is of much avail. [Author's abstract.]

Wilson, G., and Winkelman, N. W. PARTIAL CONTINUOUS EPILEPSY. [Am. Arch. Neur. and Psych., May, 1924.]

Partial continuous epileptic attacks may be due to microscopic lesions in the cortex, according to this study. It is important to realize this possibility because pathologic study of two of the cases showed that a great many cells were unaffected, and the chances for recovery, at least to some extent, were good. When partial continuous epilepsy occurs, the natural tendency of most diagnosticians is to visualize a more or less gross lesion of the brain, such as a tumor, abscess, subdural or extradural hemorrhage. It is a well known fact that perhaps the most common cause of jacksonian epilepsy is idiopathic epilepsy.

Patrick, Hugh T., and Levy, David M. EARLY CONVULSIONS IN EPILEPTICS AND IN OTHERS. [Journal A. M. A., Feb. 2, 1924.]

These authors compared all early convulsions occurring in a group of 500 epileptics and a group of 752 "unselected" infants and children. The epileptics were private patients with idiopathic epilepsy and no other clinical findings. The unselected group consisted of infants and children seen at better baby conferences in one urban and two rural communities in Illinois. Both groups are representative of "private practice," as contrasted with institutional and dispensary groups. Ninety-eight cases, or about 20 per cent of early convulsions, were found in the epileptic group; thirty-two cases, or about 4 per cent, in the unselected group. The frequency of early convulsions in the epilepsy group was in a general way inversely proportional to the age at the time of the first epileptic convulsion. According to our records, early convulsions are three times as frequent when the epilepsy begins in the first decade of life as when it begins in the third decade. Probably this is largely due to factors such as the patient's poor memory, or incompleteness of data due to the mother's absence at the time of history-taking. We believe the figure twenty to be a low estimate. The presence of early convulsions, especially if repeated, *per se* multiplies the individual's ordinary chances of epilepsy by at least five—in itself a scarcely insignificant risk. There is a prepondering number of single early convulsions in the nonepileptic group (65 per cent of the total), and of multiple convulsions in the epileptic group (76 per cent of the total). The majority of early convulsions in the nonepileptic group

(75 per cent) occur between six and seventeen months, and most of these are between eleven and thirteen months. In the epileptic group, 63 per cent of the early convulsions occur under six and over seventeen months; only 37 per cent between six and seventeen months. As contrasted with the "epileptic" early convulsions, the nonepileptic are typically brief, generalized, and not followed by confusion or prolonged stupor. The same types of assigned causes occur in two series, with teething highest in frequency in the nonepileptic; trauma and "reflex" causes in the epileptic, especially birth trauma. In the latter group there is a contrasting high percentage of "unassigned causes." Regarding sex distribution and incidence of epilepsy in the family history, there is a definite similarity in the two groups. Within the unselected series, the group with early convulsions contains relatively seven times as many families with instances of early convulsions in relatives as does the remainder, and a much higher frequency of epilepsy. The family histories of all the groups studied do not significantly differ in the frequency of miscarriages, stillbirths, deaths in infancy or forceps deliveries. The authors conclude that convulsions in infancy and childhood not epileptic, spasmophilic or symptomatic of a gross brain lesion, are evidence in themselves of the individual's increased chance of later epilepsy. There is no definite "interval of safety" beyond which epilepsy will not occur.

Thom, D. A. RELATION BETWEEN INFANTILE CONVULSIONS AND CHRONIC CONVULSIVE DISORDERS OF LATER LIFE. [*Am. Arch. Neur. and Psych.*, June, 1924. J. A. M. A.]

This report is represented by Thom as the initial step in what is to be an extended study. The problem is to determine not only the relation between infantile convulsions and the chronic convulsive disorders of later life, but also to ascertain which type of convulsions may be considered malignant and which, if any, may be benign. The material for this study was collected from three hospitals and consisted of 111 patients who had convulsions prior to the fourth year, not associated with any acute or chronic cerebral condition, such as encephalitic and meningitic processes, neoplasms, trauma and conditions due to lack of cerebral development. The cases considered were those in which the convulsions were associated with gastro-intestinal disturbances, acute infections, spasmophilia, pertussis, rickets, and also cases in which there was no associated disease or symptom complex, other than the convulsions. These cases were divided into two groups according to the subsequent findings; the first with probable brain damage and the second without evidence of brain damage. In the malignant group are included all cases in which the convulsions persisted until the time of death, and the living patients who are either having convulsions at the present time, or who are mentally deficient. In the benign group are placed those patients who have survived without evidence of brain damage. Sixty-two cases belong in the malignant group, while forty-seven belong to the second group. Twenty-four of the forty-

two patients having convulsions associated with gastro-intestinal upsets belong to the brain damage group, of which four are dead, fifteen are living and having convulsions, and five are mentally deficient. Of twenty-nine cases in which a diagnosis of spasmophilia was made, sixteen belong to the malignant group. The type of nervous system that reacts with convulsions in the presence of some mild toxemia associated with gastro-intestinal upsets, is the type that needs protection from environmental situations. The individual must be steered so as to avoid many of the gales which the normal individual is quite capable of weathering. Thus convulsions may, perhaps, be considered as the criterion of the stability or instability of the nervous system.

Marchand, L. EPILEPTIC ATTACKS WITHOUT LOSS OF CONSCIOUSNESS. [La Presse medicale, 1924, XXXII, 290.]

One of the predominant characteristics of certain epileptic attacks is the loss of consciousness. This may be absent, and its absence does not exclude the diagnosis of epilepsy. There are three possibilities: The subject may be conscious of what is occurring all about him during the initial attack, but may fail to remember it after the crisis. The subject may not lose consciousness during the crisis and may remember what has occurred. The attack may be conscious and amnesic, but the memory of the attack may persist for only a short time, like the memory of a dream which is soon effaced. The conscious form of attack is rare (7 per cent), and is generally observed in the case of subjects who have undergone treatment with bromide or gardenal.

In another form of the attack, consciousness is conserved but the subject is unable to move or to utter a sound. These attacks usually alternate with the classical epileptic seizures. The patient falls, and appears to lose consciousness. The face is pale, the eyelids remain half-opened, the eyeballs are not rolled back, the pupils are insensible to light, the pulse is rapid, respiration is irregular, there is no emission of urine and no convulsions, and sensibility appears to be abolished. The attack lasts for a few minutes, after which the subject is able to speak, and repeats all that has been said to him and what has been done. In some cases the subject perceives all that goes on within his direct field of vision, but is unable to move his eyes. He feels pricking and pinching and even touch. In a few cases, only pain sensibility is lost. A case is cited in which the patient fell as she was bending over an open hearth. She retained full consciousness, felt herself slide to the floor, with her face against the hot coals, heard her hair sizzle, but experienced absolutely no pain, and was unable to move or to call for assistance. On the other hand, during the conscious attacks, the patient may experience excruciating pain, especially in the cranium. Anarthria is usually present, although occasionally the patient may answer questions in monosyllables badly articulated. It has been objected that these conscious attacks are actually jacksonian epilepsy. However, these patients have had previous, frequent

attacks since infancy, and therefore the disturbance cannot be attributed to a cerebral lesion in process of evolution. They do not exhibit any symptoms of disturbances of motor or sensory functions or of sensibility indicating a cortical lesion. The convulsions are usually generalized. The atypical attacks cannot be attributed to hysteria. These patients do not exhibit hypermotivity, visceral spasms, tears, or other hysteric stigmata. The conscious attacks resemble the usual amnesic attacks in all respects, as regards the acceleration of pulse, elevation of temperature, pupillary disturbances and abnormality of the reflexes.

Lobstein, J. PROGRESSIVE MYOCLONUS EPILEPSY. [Ned. Tijd. v. Geneeskunde, April 5, 1924.]

The chronic myoclonus epilepsy developed in the girl of thirteen and ran its rapidly progressive course in seven years. The parents were Jewish and related. The disease was in three phases, as described by Lundborg.

van Londen, D. M. EPILEPSY WITH SCHUSTER'S "SHAGREEN-SKIN." [Nederlandsch Tijdschr. voor Geneeskunde, LXVIII, June 7, p. 2690.]

van Londen has shown a woman who has been an epileptic for five years with frequent attacks which have been worse for about a year. She presents the typical "shagreen-skin" described by Schuster as occurring in tuberosc sclerosis. This condition is seen about the level of the pelvis; it was present in one of the members—also an epileptic—of van Bouwdijk Bastiaanse's family of tuberosc sclerosis. Up to the present time van Londen's patient has not shown any other signs of tuberosc sclerosis, but presumably she has the little nodosities of this disease in her brain; and further careful research will be carried out in her eye-grounds and kidneys to determine the presence of the characteristic tuberosc nodules. [Leonard J. Kidd, London, England.]

Gareiso, A. EPILEPSY IN CHILDREN. [Archiv. Lat.-Amer. Ped., Feb., 1924.]

In 30 per cent of the epileptics here studied convulsions in early childhood had taken place. He regards epilepsy as always the result of some organic lesion of the brain.

Weidner, E. PROTEIN TREATMENT OF EPILEPSY. [Deut. med. Woch., May 2, 1924.]

Weidner has had negative results with injections of proteins in epileptics.

Weeks, D. F., et al. DIETS AND FASTING IN EPILEPSY. [Jl. Metabolic Research, 1923, III, 117. Ed. J. A. M. A.]

The predominantly toxic nature of the causes of symptomatic and experimental epilepsy leads naturally to the suspicion that some toxic substance is responsible for the fits of idiopathic or essential epilepsy.

The intestine is one possible site for the origin of such toxins; it is conceivable that they could arise from faults in digestion, from fermentation produced by bacterial growth, or in other ways. The hypothesis that they arise by fermentation has led to measures directed toward changing the flora of the intestinal tract, sometimes by heroic means, but so far without lasting therapeutic success. Efforts to control epilepsy by dietary regulation have for years been attempted, and heretofore have been largely empiric. It is a common custom to limit the consumption of meat by epileptics on the assumption that excessive protein and particularly excess of purins favor the occurrence of "fits." Within the last two years, prolonged abstinence from food of all kinds has been somewhat extensively exploited as a cure for epilepsy, and has been the subject of special study. Carefully controlled investigations of the effects of variations in the quantities and composition of foods in epilepsy are therefore especially welcome.

Weeks, Renner, Allen and Wishart,* working with patients under complete control at the State Village for Epileptics, Stillman, N. J., have studied the effects of complete fasting and also of a nonnutritive bulk diet continued for periods of three weeks. In many cases the fits decreased in number, in some they ceased entirely, in others there was no change in frequency. In general, after the termination of the fast, the attacks recurred as frequently as before. Similar results from starvation have been reported by Goldbloom. Lennox observed decrease in the number of fits under similar conditions, and reports that studies of the nonprotein nitrogen in the blood, which had been uniformly within normal limits before the fast, revealed a marked increase, especially of the uric acid traction. The conclusion, therefore, seemed justified that fits were not caused in these cases by a large excess of uric acid or other nonprotein nitrogenous compounds in the blood.

Weeks and his co-workers also studied small groups of patients who were maintained for several weeks on high protein (up to 260 gm. with 32 gm. of fat), high calory (over 8,000), high carbohydrate (from 500 to 800 gm.) and high fat (from 260 to 440 gm.) diets. They concluded that none of these diets had a demonstrable relation to the frequency of the fits. These results are somewhat disconcertingly at variance with generally prevailing opinion. They conflict with the observations reported by Cuneo, to which reference was made in an earlier editorial, that the incidence of fits was much greater with a high carbohydrate than with a high protein diet.

It seems, therefore, that at present there is no justification for exploiting any particular dietary regimen for general application in the management of epilepsy. Common sense avoidance of materials that give rise to gastric or intestinal indigestion, with due regard for individual idiosyn-

* Weeks, D. F.; Renner, D. S.; Allen, F. M., and Wishart, Mary B. Observations on Fasting and Diets in the Treatment of Epilepsy. *J. Metab. Res.*, III, 317 (Feb.), 1923.

crasies, must continue to guide the selection of the appropriate diet, in epilepsy as well as in other diseases. Particularly should it be emphasized that, while it is true that the number of fits often diminishes during a period of starvation, there is no justification for claims that this measure is in any sense a cure for epilepsy; the remarkable changes in the blood chemistry, as well as common sense, lead to the suspicion that it may be a cause of potential, if not immediate, actual damage. (The authors show no acquaintance with the relations between fasting and erotic excitement or a host of energy problems related to the "libido" concept.)

3. PSYCHOSES.

Birnbaum, K. FUNDAMENTAL CONCEPTIONS FOR CLINICAL CLASSIFICATION. [Zschr. f. d. ges. Neur. u. Psych., Vol. LXXIV, Nos. 1-3.]

The author discusses the manner in which the various factors of a psychosis must be considered to arrive at the most useful clinical classification. He illustrates his position with a scheme which he has worked out in great detail to serve as a model. He believes that a psychosis is a vital functioning unit consisting of the working together of a number of different forces. The factors which thus act together vary greatly in importance. There are those of great significance which are closely related to the disease process considered. These are formal structural elements of a general elemental nature. Those of lesser significance are extraneous factors, grafted on, derived, plastically constructed, pathoplastic he calls them, but not belonging to the essential nature of the disease. In clinical classification those may be considered the more general fundamental forms which show themselves constant and of the same nature as regards the same pathogenic agent. These still remain evident in the last clinical analysis when all the extraneous pathoplastic matter has been stripped away.

Kahn, E. HEREDITARY CONSTITUTION IN THE ORIGIN, STRUCTURE AND CLASSIFICATION OF THE PSYCHOSES. [Zschr. f. d. ges. Neur. u. Psych., Vol. LXXIV, Nos. 1-3.]

Kahn advocates the consideration of forms of psychotic manifestations in relation to inherited constitution, constellation and environment. By constellation he means the changes acquired by the organism in relation to the environment, that is characteristics acquired by the individual in his own lifetime. He believes that this approach to the subject of pathogenic components promises light in many fields. He believes that manic-depressive psychosis, dementia precox and epilepsy are to be explained on the ground of biological inheritance, these diseases to be taken as exclusively constitutionally conditioned. Two distinct factors combine to cause any one of the three diseases. In the case of manic-depressive psychosis there is a fundamental endocrinous-circulatory disorder to which the affectivity, labile elastic in nature, is attuned.

Schizophrenia rests upon a disposition toward the schizoid which develops only in certain psychopathic types and upon a tendency to a progressive psychosis. In epilepsy there is the disposition toward the epileptoid to which again only a certain psychopathic type corresponds. There is also a disposition to fundamental epileptic-endotoxic disturbance.

Delirium tremens and general paresis are presented as examples of diseases preëminently constellative in cause. Yet in general paresis in many atypical forms many other factors have to be considered as playing their part. The ordinary stimuli of life may be sufficient to bring into action the purely hereditary constitutional forms of psychoses, but the purely constellative forms can arise on any inherited constitution whatsoever. The hereditary constitutional forms may be taken as forming a group of their own while the constellative forms must be divided into secondary groups, mechanical, toxic, infectious, etc. A simple diagnosis is often impossible since mixed dispositions of many sorts will appear. Besides essential alterations in the disease picture will be caused by the action of constellative factors upon constitutional diseases or the converse.

Hoffmann, H. CONSTITUTIONAL PROBLEM IN PSYCHIATRY. [Zschr. f. d. ges. Neur. u. Psych., Vol. LXXIV, Nos. 1-3.]

Hoffmann lays emphasis upon the necessity in psychological research of distinguishing constitutional and constellative characteristics and above all the disclosing of the constitutional factors as they lie hidden under the constellative ones. The constitutional factors must be considered first of all in the light of their constitutional valency. This in turn must be measured according to the strength or weakness of the environmental factors which have been required to bring about the development of the symptom pattern. This constitutional valency is of great practical importance in the setting up of exact rules of heredity. Hoffmann follows Kretschmer in considering manic-depressive psychosis and schizophrenia as typical diseases developing from constitutional factors. He refers to the heredo-biological relation of the presenile delusion of injury, the paraphrenias and paranoia to schizophrenia. There appear to be here what he calls "intermediary constitutions" about the constitutional dispositions. This fact can be seen in its significance in individual cases with manic-depressive and schizophrenic inheritance. It can be fairly well demonstrated many times in melancholics of the involutional period. Constitutional factors come very much into play even in considering disorders which are predominantly constellative. Hoffmann gives examples of the questions which should be asked in a careful investigation of the family for clinical evidences, a matter upon which he lays special emphasis. He sets forth the following as a rule in regard to closeness of kin: If two clinical abnormalities hitherto classified as independent entities appear with special frequency in a family in close hereditary proximity a biological relationship, *i.e.*, the

participation of the same constitutional elements, may be considered demonstrated.

Uribe, G. UREMIA IN MENTAL AFFECTIONS. [Rep. d. Med. y Cir., Nov., 1922.]

The influence of climate and of dietaries upon urea excretion is well illustrated in Colombia where the excretion averages lower than the established European averages. In this country the urea content of the urine averaged only from 9.5 to 11.4 parts per thousand, and of the blood, below 0.35. Figures above or below in Colombia are termed pathological. Thirty patients with various psychopathies are analyzed from these norms. The urea content of the blood was always high in the severer cases and in the exacerbations of all forms. In one case of a confusional psychopathy with stupor, the blood contained 0.56 per thousand, but as the patient improved, it dropped to 0.32. Azotemia was a constant finding in the depressed manics.

Hartung, E. LATE RECOVERY OF A PSYCHOSIS. [Zschr. f. d. ges. Neur. u. Psych., Vol. LXXX, Nos. 1-4.]

This was a case of catatonia diagnosed by the author as manic-depressive psychosis. After twenty-two years of necessary confinement in an institution the patient has been socially active for two years without any pathological manifestations.

Mott, F. W. MENTAL HYGIENE IN RELATION TO INSANITY AND ITS TREATMENT. [An Address delivered on October 10, 1922, to the Students' Medical Society, Charing Cross Hospital, London.]

The author advocates the treatment of early mental cases without certification. He points out that this treatment was adopted in the army during the war, and subsequently by the ministry of pensions. He notes, however, that it will be necessary to have an alteration in the existing laws, for the voluntary boarder, however dangerous he may be to himself or others, cannot be kept under restraint in a mental hospital against his wish at present for more than twenty-four hours. He next directs attention to existing mental hospitals and the treatment of early cases. He is of opinion that all cases not definitely diagnosable as incurable if sent to a county or borough asylum be received in a hospital apart from the main building. Every mental hospital should have an out-patient clinic attached, or better affiliated with a clinic outside the asylum grounds, and especially adapted and equipped for the treatment of early mental cases. He next calls attention to the valuable work done by the National Committee of Mental Hygiene of the United States of America.

Particular attention is directed in this address to the value of scientifically conducted research in hospitals and laboratories into the causes, prevention, and treatment of insanity by skilled properly paid medical

officers and social workers, and the author points out the fact that the war has shown the great need of systematic teaching in psychological medicine. He observes that the difficulty regarding the treatment by the ministry of pensions of ex-service men in asylums arose from the fact that a large number of potential lunatics were admitted into the army, and this might to a great extent have been avoided had medical men known more about incipient mental disease. He refers to the fact that Sir George Newman in an admirable report on medical education in 1920 stated, "It is deplorable that the English student of medicine should have no opportunity of learning methods of psychiatry or of diagnosing incipient and undeveloped cases of mental disease." The author alludes to the fact that as early as 1907 he advocated granting a diploma of psychological medicine and the establishment of a psychiatric clinic in London where incipient and borderland cases could be treated, and a little later this led to the late Dr. Maudsley approaching the London County Council, through him, with an offer of £30,000 if that body would build a hospital for the treatment of early mental cases, and for the study and teaching of mental disease. The scheme took a long time to mature, and the hospital, which bears Maudsley's name, was not completed when the war broke out. However, in 1916 it was completed, and both during the war, and since, it has fulfilled those portions of its function which relate to research and teaching. Five systematic courses of instruction in psychological medicine have been given there. The author advocates a central research laboratory for groups of mental hospitals. He alludes to the necessity of varying the diet in mental hospitals so as to avoid monotony. Finally he calls attention to the therapeutic value of occupation with *interest*, and he concludes with the truism "Variety is the spice of life," but that is just what this institutional life does not provide. [Author's Abstract.]

4. MEDICO-LEGAL; SOCIAL.

Hames, Fred. COMPENSATION. [Jl. Med. Asso. of Georgia, July, 1922, Vol. XI, No. 7, p. 269.]

Compensation as a law became effective in Georgia March 1, 1921, and is a law primarily for those employed in industry. The law is wide in its scope and covers all cases of injury to employees while in their line of duty. The different purposes of the law are to compensate injured workmen for loss of members or for loss of time as a result of bodily injury, to provide for medical expenses within a limit and for all treatment in such injuries, also covers loss of life and permanent disability, the maximum payment in such cases being \$4,000 and in cases of death an allowance of \$100 for funeral expenses. To illustrate: Should a man lose a leg he would be entitled to one hundred and seventy-five weeks' compensation based on fifty per cent of his average earnings, not to be more than twelve dollars per week

and not under six dollars per week. The loss of other members is compensated for proportionately as are such injuries as would constitute a permanent partial disability. The type of injury varies anywhere from minor abrasions to the loss of members and life. The majority of cases are of a trivial nature and do not necessitate a loss of time. Some cases are not reported to the foreman or employer until they have become infected. We also have to deal with cases of supposed injury or malingerers and this is not an infrequent problem. I have had any number of cases in which no evidence of injury could be found, yet these employees will remain away from work anywhere from a few days to two or three months. A goodly proportion of this type of cases come in supposedly back injuries which, in my opinion, are the most difficult ones to disprove. Other difficult injuries are those supposedly of the ear and abdominal cases. Not infrequently are venereal cases charged by employees to some alleged accident. The causes of a great number of these industrial accidents, of course, are many and varied. Many are directly traceable to the absolute carelessness on the part of the employee, and I believe that this forms the largest percentage of the total. A great many of the accidents are caused by the faulty placing of employee as to his ability for the character of work that he is to do. An individual of the plodding type is placed upon piece work, when in reality he should be on day work or paid by the hour. We also have the opposite where the nervous energetic workman is placed where the plodder should be. The plodding type of individual in his effort to make a showing is often injured by the increased effort on his part and the same applies to the energetic and nervous individual in that he loses his incentive and becomes careless. Other frequent cases are in the improper guarding of machines. I have in mind one machine that in one year was responsible for the amputation or partial amputation of eighteen fingers. Poor lighting and wet floors are frequent causes and it is not infrequent that injuries of the feet come from the wearing of shoes from which the soles are worn away. Poorly constructed scaffolds also contribute their toll of injuries.

What is to be done for the prevention of these accidents? It is up to us as physicians to advise and educate employees in prevention of accidents and to coöperate with the employers in removing the source of frequent injury. It would not be amiss to have first aid and accident prevention lectures given the employees in the larger plants at regular periods, and I am of the opinion that it would be a good investment for the employer to have frequent casual examinations of his employees in reference to their health and frequent inspections of the sanitary and physical conditions of his plant. This law contemplates medical expense in a sum not to exceed \$100 which expense must be within the first thirty days. This \$100 is to cover all of the expense incidental to injury, such as hospital, ambulance, X-ray, etc. In a certain proportion of cases this is absolutely inadequate and we

face the problem of receiving no fee unless some special arrangement is made. It has been my experience that the insurance carrier or the employer will, in the majority of cases, authorize an additional sum where he can be shown that the employee will be benefited and that permanent disability will be lessened or done away with, which, of course, is a wise investment for him. There have been, however, many instances where the employer or insurance carrier has been taken advantage of and where the expense has been increased out of proportion to the injury. All bills are paid by the insurance company and we must remember that this charge is one incident to the charge paid the insurance company by the manufacturer for coverage. With an increase in his medical expense from the average upon which his rate is promulgated, he will have to pay an increased rate and we should consider always that it is our neighbor and our friend, the employer, that is in reality paying the medical expense. I cannot too strongly impress this fact, for in one or more states there has been a change in the law and no provision is made for the guaranteeing of medical expense and the doctor is forced to look to the workman himself for payment for his services. We should consider the fact that in handling these cases we have a practical guarantee of fees and should show consideration in our charges, and we should also remember that it is the purpose of the law that services for treating an injured workman should be in proportion to his station in society. The treatment of these cases resolves itself into the injury presented. We should bear in mind that all cases of industrial injury are potential charities; that is, if the workman is unable to resume his duties, it will not be a great while before he will become a public care and conservatism should be practiced in all cases. We should lend our greatest efforts to the saving of members and the prevention and treatment of deformities and permanent disabilities. We should bear in mind that in treating these cases in the majority of instances we have a most trusting patient and every effort should be made to make him comfortable and restore him to health. Every effort should be made at a proper diagnosis and the X-ray should be employed in all cases of suspected bone injury. Badly lacerated wounds of the fingers and hands should be thoroughly cleansed and the macerated tissues removed, tendons sutured and any open fractures reduced as soon after injury as it is possible to do so, and all wounds should be kept continuously moistened with 25 per cent listerine solution. If you will take injuries of this kind and properly splint them, it will be an exception in which amputation will be necessary. Personally, I believe that the open reduction of fractures where the soft tissues are badly damaged is wrong and that more conservative treatment is necessary if these cases are to be saved. In injuries to the soft parts all cases in which the skin is broken are treated as infected injuries from the beginning. I make it a rule to give all cases presented with punctured wounds and all cases of

traumatic amputation a preventive dose of tetanus antitoxin. This is an inexpensive procedure, but the prevention of one case of tetanus per year will more than pay for all the antitoxin used. In conclusion, I wish to make the appeal for more conservative treatment of industrial injuries and for closer attention to the detailed handling of injured workmen. Let us study these cases and strive to rehabilitate the injured workman. (Author's Abstract.)

Sabatucci, F. THE COCAIN SYNDROME. [Policlinico, Vol. XXIX, p. 235.]

This study of the cocain symptom complex based upon careful analysis of eighteen cases of acute and chronic type is well worth while.

Claude, H., and Borrel. SEXUAL PERVERSIONS AND HYPERGENITALISM. [Médecine, February, 1923.]

These authors show the relationships between hypergenitalism, as evidenced in somatic endocrinopathies, and antisocial acts. They discuss the problem of responsibility involved.

BOOK REVIEWS

Edgell, Beatrice. THEORIES OF MEMORY. [Oxford at the Clarendon Press, 1924.]

We appreciate more the value of this book as it lies in the author's critical discussion than in her own conclusions. This, however, is what she herself intended for her readers. Indeed, she writes frequently with an interrogation point and sometimes questions the validity of her own criticisms. Her final attempt to construct a psychological theory of memory leaves us with an unsupported framework in her evasion of the biological grounds which she seeks to explain away from the theories of others. The formal words, cognition and conation, with which she endeavors to fill her framework, rich as might be their significance if fully applied, fail to fathom the depths and express the functioning of a real genetic psychology which cannot stand on the plane of the purely psychical. Affectivity, which the author touches but lightly, promising more but with an unfulfilled promise, would bring the biology and the psychology in closer interrelation and aid at least in the solution of some of the difficulties which are left unsolved in other writers discussed. Dr. Edgell has most interestingly reviewed the approach which modern thought has made to psychological functioning as it appears in memory. Semon has found the basis of physical memory in physiochemical engrams; the behaviorists have emphasized the biological activity but failed to account for regulation or purposiveness introduced and to avoid the introspectionism they appear to deny; older writers have studied memory only as "matter of knowledge, not of conduct"; Bergson is a representative of a "panpsychism" which leaves unexplained mysteries. These are some of the suggestive expositions and criticisms of the book, which, if they do not always awaken agreement with Dr. Edgell's point of view, at least rouse stimulating question as to the relative value of these various theories in the pursuit of our knowledge of memory and our practical dealing with its problems.

Walsh, William S. THE MASTERY OF FEAR. [New York, E. P. Dutton & Company, New York, 1924.]

The nature of the material of this book in its presentation of facts, psychological and physiological, which pertain to fear is highly commendable: it covers a range of scientific truth which ought to do much to guide popular thought into wholesome channels of reality. The offering of advice as to the dissolution of fears and the release of one's self from their domination falls easily into the preceptive—which is of little value in correcting situations where morbid fears

control. Less of such advice would have kept the author in the more fruitful field of enlightenment where the problem is approached from the foundation up, and in which his book therefore performs its best service. Such vague concepts as that of "nervousness" control his thought to some degree and he neglects some important factors; for example, repression and resistance, two strongly dynamic elements which make it less easy to reach one's own fears in their unconscious sources than he makes it appear. Aside from some defects of this sort, evidence of failure to go far enough in the direction taken, the writing is of the kind to bring the members of the reading public to face the facts in their own mental life with the fears here interwoven and to grasp the relation of these fears to the need of adaptation to the environment and its demands. When the author discussed the protective function of fear in its original service, he might have made it less a primary instinct than a form of adaptation instinctively constructed and utilized protectively even in the so-called abnormal fears which apparently exert an unreasonable control. This would have come nearer to pointing the way into an understanding of their genesis and a realization of the need of a fundamental readjustment where this kind of protection would no longer be necessary. The chapter or two embracing the relation of fear to the sexual life may be mentioned as excellent in straightforward, instructive handling of the subject. This relation too could well have been pressed more fully into the explanation of the unconscious sources of fear.

Bose, Jagadis Chunder. *THE PHYSIOLOGY OF PHOTOSYNTHESIS.* With Sixty Illustrations. [Longmans, Green and Co., New York, Toronto, Bombay, Calcutta and Madras, 1924.]

The author has added to his many contributions upon the activity of plants a detailed exposition of experiments determining the facts of photosynthesis in a quantitative sense. This vital process of photosynthesis is not only, as the author states, "one of the fundamental cosmic processes," important because it underlies the great primitive industry of agriculture, but of interest also as a manifestation of the great law of capture, storage, and release of energy so important in the activity of all life, plant or animal, physical or psychical. "The fundamental importance of photosynthesis is, that it is the process by which the plant absorbs the energy it requires, the radiant energy of sunlight, and stores it in the form of latent or potential energy in the organic products of the process. The energy so stored can readily be set free again and become kinetic, by the chemical decomposition of the organic substances, manifesting itself in heat, electric current or movement." The author gives in detail his technical procedure with a brief summary of each chapter which keeps the reader in close touch with the practical import of the experimental data. His broad and, we might say, sympathetic conception of this essential life process make the book of particular value to the specialist in plant growth or to the investigator of any form of vital functioning in its relation to healthful effective activity.

Ceni, Carlo. THE BRAIN AND MATERNAL FUNCTIONS. Experiments in Comparative Physiology and Psychology in Two Volumes. [From the Clinic for Mental and Nervous Disorders of the Royal University of Cagliari, Italy.]

The study of psychobiology which aims at finding the relation between animal and human life, is so full of difficulties as to justify any attempt to clear this obscure problem. These difficulties consist mainly in properly determining the importance and correlation between external and internal stimuli and between those arising in the conscious mind and the unconscious. The volumes which the author has written are the fruit of those comparative researches which he continued for several years in an endeavor to elucidate, especially in the light of psychology, the maternal functions.

The research leads into the field of anatomy and physiology and attempts to correlate psychic and material phenomena and to make general deductions from the most complex and most highly evolved functions of man.

Very few psychologists, or even spiritualists, limit the term psychic to only that which succeeds in projecting itself upon our consciousness as a result of introspective observation. Even Richet, who is of the opinion that such introspection cannot have any other objective but the knowing of the individual, concludes that the science of psychology must avail itself of objective studies, of experiences and of introspective observations depending upon the study at hand.

The intimate relation between psychic phenomena and the ordinary thought processes which go on in the brain should be enough to establish the fact that all the activities of this organ must be considered as closely allied. No definite distinction can be made between the phenomena which are the result of autoinvestigation and external or objective phenomena. For example, the activities of the brain, psychic and otherwise, either conscious or unconscious, are subject to the cerebral circulation. The composition of the blood has also an important influence on the nutrition of the brain and upon its many functions. It is also equally well known that cerebral lesions in man are followed by the abolition or alteration of objective or subjective phenomena, and that the one is so obviously related to the other that modern psychology cannot consider them separately. For this reason the nervous processes can be divided into visceral and psychic, the former being the vegetative life of the animal, while the latter are the animal's life in relation to everything else and include the subjective and objective phenomena, both conscious and unconscious.

The separation of cause from effect, as pure psychology pretends to do, is no longer a tenable conception. The analytical method endeavoring to find a relationship between psychic and organic life forces itself into every psychological problem. To study this properly there is only one method: experimental comparative psychology, making use of the anatomic-physiological method, applied to species in various grades of evolution. The joining of psychology with

or mental functioning were also present. The convulsions were focal in character, or general with focal onset. In no instance did the lesion or site of injury really belie the clinical symptoms shown in the nature of convulsions, and so far as localization was concerned the injury or subsequent cerebral damage did not differ from that indicated by the clinical data. However, the clinical symptoms seemed to give no clue to the extent or degree of lesion. The operations invariably showed up lesions beyond repair. They ranged from extensive inflammatory thickening of the membranes and cortical tissues to that of deep injury, cysts or actual loss of cerebral substance. However, even trephin operations failed to disclose anywhere near the actual extent and degree of injury, as revealed at necropsy. Obviously, the seizures were not even checked for a time after operation. The degrees of injuries susceptible of necropsy analysis in twenty-one of the cases were of the following nature: injury to membranes only, two cases; injury to membranes and cortex, eight; injury to membranes, cortex and deeper parts of the brain, eleven. The lesions of the last group were most frequently conditions of cerebral softenings. Some of the lesions found at necropsy were evidently of too recent a character to have been either a part of the original trauma or of the operation directly as such. Clark summarizes as follows: Ordinary essential epilepsy is not operable. Operation on pure jacksonian epileptiform convulsions without loss of consciousness is to be undertaken only when spasm is definitely local or has a distinct and constant focal onset. Then, preferably when there is an after-defect of paresis or sensory loss which is more or less enduring, such operation belongs properly in the domain of brain surgery *per se*. Cases in which there are both grand mal and jacksonian attacks, with or without loss of consciousness, are operable only after the most careful estimate of the localizing symptoms and their clinical significance as to disease of brain structure. Often the cerebral lesions indicating symptomatic epilepsy are too remote or extensive for surgical removal. The greatest surgical care is necessary in handling the brain tissues, and this often applies to the membranes quite as specifically as to the cortical tissues themselves. Drainage disposal for the exudates already present or surgically induced must be properly met in every case. Cysts and adhesions are often prevented in this manner. Their absence lessens cortical irritation.

Ostheimer, A. J. CONVULSIVE SEIZURES IN SOLDIERS. [Arch. Neur. and Psych., Jan., 1924.]

Ostheimer has studied various types of convulsive seizures in ex-service men. He wants to confine the use of the term "epilepsy" to the syndrome characterizing convulsive attacks that have come to be known as "epileptic fits" only in case the pathogenesis is not known with any degree of exactness, namely, to the so-called cases of idiopathic epilepsy. The term epilepsy and a similar diagnosis should not be used in those cases in which exactly similar convulsive attacks occur but in which the

pathogenesis which includes psychogenesis is well or fairly well known. Under such a nosology, 40 per cent of his 241 cases fell under the heading epilepsy, while the other 60 per cent are due to congenital inferiority, hysteria, brain injuries and syphilis, endocrine disturbances, brain tumor, chronic heart disease, hystero-malingering, asthma, multiple sclerosis, chronic nephritis and gastro-intestinal disturbances. He considers the use of phenobarbital of great value in practically all cases of epilepsy, but that in the case of convulsive seizures, due to some known cause, it is a question whether phenobarbital is of much avail. [Author's abstract.]

Wilson, G., and Winkelman, N. W. PARTIAL CONTINUOUS EPILEPSY. [Am. Arch. Neur. and Psych., May, 1924.]

Partial continuous epileptic attacks may be due to microscopic lesions in the cortex, according to this study. It is important to realize this possibility because pathologic study of two of the cases showed that a great many cells were unaffected, and the chances for recovery, at least to some extent, were good. When partial continuous epilepsy occurs, the natural tendency of most diagnosticians is to visualize a more or less gross lesion of the brain, such as a tumor, abscess, subdural or extradural hemorrhage. It is a well known fact that perhaps the most common cause of jacksonian epilepsy is idiopathic epilepsy.

Patrick, Hugh T., and Levy, David M. EARLY CONVULSIONS IN EPILEPTICS AND IN OTHERS. [Journal A. M. A., Feb. 2, 1924.]

These authors compared all early convulsions occurring in a group of 500 epileptics and a group of 752 "unselected" infants and children. The epileptics were private patients with idiopathic epilepsy and no other clinical findings. The unselected group consisted of infants and children seen at better baby conferences in one urban and two rural communities in Illinois. Both groups are representative of "private practice," as contrasted with institutional and dispensary groups. Ninety-eight cases, or about 20 per cent of early convulsions, were found in the epileptic group; thirty-two cases, or about 4 per cent, in the unselected group. The frequency of early convulsions in the epilepsy group was in a general way inversely proportional to the age at the time of the first epileptic convulsion. According to our records, early convulsions are three times as frequent when the epilepsy begins in the first decade of life as when it begins in the third decade. Probably this is largely due to factors such as the patient's poor memory, or incompleteness of data due to the mother's absence at the time of history-taking. We believe the figure twenty to be a low estimate. The presence of early convulsions, especially if repeated, *per se* multiplies the individual's ordinary chances of epilepsy by at least five—in itself a scarcely insignificant risk. There is a prepondering number of single early convulsions in the nonepileptic group (65 per cent of the total), and of multiple convulsions in the epileptic group (76 per cent of the total). The majority of early convulsions in the nonepileptic group

(75 per cent) occur between six and seventeen months, and most of these are between eleven and thirteen months. In the epileptic group, 63 per cent of the early convulsions occur under six and over seventeen months; only 37 per cent between six and seventeen months. As contrasted with the "epileptic" early convulsions, the nonepileptic are typically brief, generalized, and not followed by confusion or prolonged stupor. The same types of assigned causes occur in two series, with teething highest in frequency in the nonepileptic; trauma and "reflex" causes in the epileptic, especially birth trauma. In the latter group there is a contrasting high percentage of "unassigned causes." Regarding sex distribution and incidence of epilepsy in the family history, there is a definite similarity in the two groups. Within the unselected series, the group with early convulsions contains relatively seven times as many families with instances of early convulsions in relatives as does the remainder, and a much higher frequency of epilepsy. The family histories of all the groups studied do not significantly differ in the frequency of miscarriages, stillbirths, deaths in infancy or forceps deliveries. The authors conclude that convulsions in infancy and childhood not epileptic, spasmophilic or symptomatic of a gross brain lesion, are evidence in themselves of the individual's increased chance of later epilepsy. There is no definite "interval of safety" beyond which epilepsy will not occur.

Thom, D. A. RELATION BETWEEN INFANTILE CONVULSIONS AND CHRONIC CONVULSIVE DISORDERS OF LATER LIFE. [Am. Arch. Neur. and Psych., June, 1924. J. A. M. A.]

This report is represented by Thom as the initial step in what is to be an extended study. The problem is to determine not only the relation between infantile convulsions and the chronic convulsive disorders of later life, but also to ascertain which type of convulsions may be considered malignant and which, if any, may be benign. The material for this study was collected from three hospitals and consisted of 111 patients who had convulsions prior to the fourth year, not associated with any acute or chronic cerebral condition, such as encephalitic and meningitic processes, neoplasms, trauma and conditions due to lack of cerebral development. The cases considered were those in which the convulsions were associated with gastro-intestinal disturbances, acute infections, spasmophilia, pertussis, rickets, and also cases in which there was no associated disease or symptom complex, other than the convulsions. These cases were divided into two groups according to the subsequent findings; the first with probable brain damage and the second without evidence of brain damage. In the malignant group are included all cases in which the convulsions persisted until the time of death, and the living patients who are either having convulsions at the present time, or who are mentally deficient. In the benign group are placed those patients who have survived without evidence of brain damage. Sixty-two cases belong in the malignant group, while forty-seven belong to the second group. Twenty-four of the forty-

two patients having convulsions associated with gastro-intestinal upsets belong to the brain damage group, of which four are dead, fifteen are living and having convulsions, and five are mentally deficient. Of twenty-nine cases in which a diagnosis of spasmophilia was made, sixteen belong to the malignant group. The type of nervous system that reacts with convulsions in the presence of some mild toxemia associated with gastro-intestinal upsets, is the type that needs protection from environmental situations. The individual must be steered so as to avoid many of the gales which the normal individual is quite capable of weathering. Thus convulsions may, perhaps, be considered as the criterion of the stability or instability of the nervous system.

Marchand, L. EPILEPTIC ATTACKS WITHOUT LOSS OF CONSCIOUSNESS. [La Presse medicale, 1924, XXXII, 290.]

One of the predominant characteristics of certain epileptic attacks is the loss of consciousness. This may be absent, and its absence does not exclude the diagnosis of epilepsy. There are three possibilities: The subject may be conscious of what is occurring all about him during the initial attack, but may fail to remember it after the crisis. The subject may not lose consciousness during the crisis and may remember what has occurred. The attack may be conscious and amnesic, but the memory of the attack may persist for only a short time, like the memory of a dream which is soon effaced. The conscious form of attack is rare (7 per cent), and is generally observed in the case of subjects who have undergone treatment with bromide or gardenal.

In another form of the attack, consciousness is conserved but the subject is unable to move or to utter a sound. These attacks usually alternate with the classical epileptic seizures. The patient falls, and appears to lose consciousness. The face is pale, the eyelids remain half-opened, the eyeballs are not rolled back, the pupils are insensible to light, the pulse is rapid, respiration is irregular, there is no emission of urine and no convulsions, and sensibility appears to be abolished. The attack lasts for a few minutes, after which the subject is able to speak, and repeats all that has been said to him and what has been done. In some cases the subject perceives all that goes on within his direct field of vision, but is unable to move his eyes. He feels pricking and pinching and even touch. In a few cases, only pain sensibility is lost. A case is cited in which the patient fell as she was bending over an open hearth. She retained full consciousness, felt herself slide to the floor, with her face against the hot coals, heard her hair sizzle, but experienced absolutely no pain, and was unable to move or to call for assistance. On the other hand, during the conscious attacks, the patient may experience excruciating pain, especially in the cranium. Anarthria is usually present, although occasionally the patient may answer questions in monosyllables badly articulated. It has been objected that these conscious attacks are actually jacksonian epilepsy. However, these patients have had previous, frequent

attacks since infancy, and therefore the disturbance cannot be attributed to a cerebral lesion in process of evolution. They do not exhibit any symptoms of disturbances of motor or sensory functions or of sensibility indicating a cortical lesion. The convulsions are usually generalized. The atypical attacks cannot be attributed to hysteria. These patients do not exhibit hypermotivity, visceral spasms, tears, or other hysteric stigmata. The conscious attacks resemble the usual amnesic attacks in all respects, as regards the acceleration of pulse, elevation of temperature, pupillary disturbances and abnormality of the reflexes.

Lobstein, J. PROGRESSIVE MYOCLONUS EPILEPSY. [Ned. Tijd. v. Geneeskunde, April 5, 1924.]

The chronic myoclonus epilepsy developed in the girl of thirteen and ran its rapidly progressive course in seven years. The parents were Jewish and related. The disease was in three phases, as described by Lundborg.

van Londen, D. M. EPILEPSY WITH SCHUSTER'S "SHAGREEN-SKIN." [Nederlandsch Tijdschr. voor Geneeskunde, LXVIII, June 7, p. 2690.]

van Londen has shown a woman who has been an epileptic for five years with frequent attacks which have been worse for about a year. She presents the typical "shagreen-skin" described by Schuster as occurring in tuberose sclerosis. This condition is seen about the level of the pelvis; it was present in one of the members—also an epileptic—of van Bouwdijk Bastiaanse's family of tuberose sclerosis. Up to the present time van Londen's patient has not shown any other signs of tuberose sclerosis, but presumably she has the little nodosities of this disease in her brain; and further careful research will be carried out in her eye-grounds and kidneys to determine the presence of the characteristic tuberose nodules. [Leonard J. Kidd, London, England.]

Gareiso, A. EPILEPSY IN CHILDREN. [Archiv. Lat.-Amer. Ped., Feb., 1924.]

In 30 per cent of the epileptics here studied convulsions in early childhood had taken place. He regards epilepsy as always the result of some organic lesion of the brain.

Weidner, E. PROTEIN TREATMENT OF EPILEPSY. [Deut. med. Woch., May 2, 1924.]

Weidner has had negative results with injections of proteins in epileptics.

Weeks, D. F., et al. DIETS AND FASTING IN EPILEPSY. [Jl. Metabolic Research, 1923, III, 117. Ed. J. A. M. A.]

The predominantly toxic nature of the causes of symptomatic and experimental epilepsy leads naturally to the suspicion that some toxic substance is responsible for the fits of idiopathic or essential epilepsy.

The intestine is one possible site for the origin of such toxins; it is conceivable that they could arise from faults in digestion, from fermentation produced by bacterial growth, or in other ways. The hypothesis that they arise by fermentation has led to measures directed toward changing the flora of the intestinal tract, sometimes by heroic means, but so far without lasting therapeutic success. Efforts to control epilepsy by dietary regulation have for years been attempted, and heretofore have been largely empiric. It is a common custom to limit the consumption of meat by epileptics on the assumption that excessive protein and particularly excess of purins favor the occurrence of "fits." Within the last two years, prolonged abstinence from food of all kinds has been somewhat extensively exploited as a cure for epilepsy, and has been the subject of special study. Carefully controlled investigations of the effects of variations in the quantities and composition of foods in epilepsy are therefore especially welcome.

Weeks, Renner, Allen and Wishart,* working with patients under complete control at the State Village for Epileptics, Stillman, N. J., have studied the effects of complete fasting and also of a nonnutritive bulk diet continued for periods of three weeks. In many cases the fits decreased in number, in some they ceased entirely, in others there was no change in frequency. In general, after the termination of the fast, the attacks recurred as frequently as before. Similar results from starvation have been reported by Goldbloom. Lennox observed decrease in the number of fits under similar conditions, and reports that studies of the nonprotein nitrogen in the blood, which had been uniformly within normal limits before the fast, revealed a marked increase, especially of the uric acid traction. The conclusion, therefore, seemed justified that fits were not caused in these cases by a large excess of uric acid or other nonprotein nitrogenous compounds in the blood.

Weeks and his co-workers also studied small groups of patients who were maintained for several weeks on high protein (up to 260 gm. with 32 gm. of fat), high calory (over 8,000), high carbohydrate (from 500 to 800 gm.) and high fat (from 260 to 440 gm.) diets. They concluded that none of these diets had a demonstrable relation to the frequency of the fits. These results are somewhat disconcertingly at variance with generally prevailing opinion. They conflict with the observations reported by Cuneo, to which reference was made in an earlier editorial, that the incidence of fits was much greater with a high carbohydrate than with a high protein diet.

It seems, therefore, that at present there is no justification for exploiting any particular dietary regimen for general application in the management of epilepsy. Common sense avoidance of materials that give rise to gastric or intestinal indigestion, with due regard for individual idiosyn-

* Weeks, D. F.; Renner, D. S.; Allen, F. M., and Wishart, Mary B. Observations on Fasting and Diets in the Treatment of Epilepsy. *J. Metab. Res.*, III, 317 (Feb.), 1923.

crasies, must continue to guide the selection of the appropriate diet, in epilepsy as well as in other diseases. Particularly should it be emphasized that, while it is true that the number of fits often diminishes during a period of starvation, there is no justification for claims that this measure is in any sense a cure for epilepsy; the remarkable changes in the blood chemistry, as well as common sense, lead to the suspicion that it may be a cause of potential, if not immediate, actual damage. (The authors show no acquaintance with the relations between fasting and erotic excitement or a host of energy problems related to the "libido" concept.)

3. PSYCHOSES.

Birnbaum, K. FUNDAMENTAL CONCEPTIONS FOR CLINICAL CLASSIFICATION. [Zschr. f. d. ges. Neur. u. Psych., Vol. LXXIV, Nos. 1-3.]

The author discusses the manner in which the various factors of a psychosis must be considered to arrive at the most useful clinical classification. He illustrates his position with a scheme which he has worked out in great detail to serve as a model. He believes that a psychosis is a vital functioning unit consisting of the working together of a number of different forces. The factors which thus act together vary greatly in importance. There are those of great significance which are closely related to the disease process considered. These are formal structural elements of a general elemental nature. Those of lesser significance are extraneous factors, grafted on, derived, plastically constructed, pathoplastic he calls them, but not belonging to the essential nature of the disease. In clinical classification those may be considered the more general fundamental forms which show themselves constant and of the same nature as regards the same pathogenic agent. These still remain evident in the last clinical analysis when all the extraneous pathoplastic matter has been stripped away.

Kahn, E. HEREDITARY CONSTITUTION IN THE ORIGIN, STRUCTURE AND CLASSIFICATION OF THE PSYCHOSES. [Zschr. f. d. ges. Neur. u. Psych., Vol. LXXIV, Nos. 1-3.]

Kahn advocates the consideration of forms of psychotic manifestations in relation to inherited constitution, constellation and environment. By constellation he means the changes acquired by the organism in relation to the environment, that is characteristics acquired by the individual in his own lifetime. He believes that this approach to the subject of pathogenic components promises light in many fields. He believes that manic-depressive psychosis, dementia precox and epilepsy are to be explained on the ground of biological inheritance, these diseases to be taken as exclusively constitutionally conditioned. Two distinct factors combine to cause any one of the three diseases. In the case of manic-depressive psychosis there is a fundamental endocrinous-circulatory disorder to which the affectivity, labile elastic in nature, is attuned.

Schizophrenia rests upon a disposition toward the schizoid which develops only in certain psychopathic types and upon a tendency to a progressive psychosis. In epilepsy there is the disposition toward the epileptoid to which again only a certain psychopathic type corresponds. There is also a disposition to fundamental epileptic-endotoxic disturbance.

Delirium tremens and general paresis are presented as examples of diseases preëminently constellative in cause. Yet in general paresis in many atypical forms many other factors have to be considered as playing their part. The ordinary stimuli of life may be sufficient to bring into action the purely hereditary constitutional forms of psychoses, but the purely constellative forms can arise on any inherited constitution whatsoever. The hereditary constitutional forms may be taken as forming a group of their own while the constellative forms must be divided into secondary groups, mechanical, toxic, infectious, etc. A simple diagnosis is often impossible since mixed dispositions of many sorts will appear. Besides essential alterations in the disease picture will be caused by the action of constellative factors upon constitutional diseases or the converse.

Hoffmann, H. CONSTITUTIONAL PROBLEM IN PSYCHIATRY. [Zschr. f. d. ges. Neur. u. Psych., Vol. LXXIV, Nos. 1-3.]

Hoffmann lays emphasis upon the necessity in psychological research of distinguishing constitutional and constellative characteristics and above all the disclosing of the constitutional factors as they lie hidden under the constellative ones. The constitutional factors must be considered first of all in the light of their constitutional valency. This in turn must be measured according to the strength or weakness of the environmental factors which have been required to bring about the development of the symptom pattern. This constitutional valency is of great practical importance in the setting up of exact rules of heredity. Hoffmann follows Kretschmer in considering manic-depressive psychosis and schizophrenia as typical diseases developing from constitutional factors. He refers to the heredo-biological relation of the presenile delusion of injury, the paraphrenias and paranoia to schizophrenia. There appear to be here what he calls "intermediary constitutions" about the constitutional dispositions. This fact can be seen in its significance in individual cases with manic-depressive and schizophrenic inheritance. It can be fairly well demonstrated many times in melancholics of the involutional period. Constitutional factors come very much into play even in considering disorders which are predominantly constellative. Hoffmann gives examples of the questions which should be asked in a careful investigation of the family for clinical evidences, a matter upon which he lays special emphasis. He sets forth the following as a rule in regard to closeness of kin: If two clinical abnormalities hitherto classified as independent entities appear with special frequency in a family in close hereditary proximity a biological relationship, *i.e.*, the

participation of the same constitutional elements, may be considered demonstrated.

Uribe, G. UREMIA IN MENTAL AFFECTIONS. [Rep. d. Med. y Cir., Nov., 1922.]

The influence of climate and of dietaries upon urea excretion is well illustrated in Colombia where the excretion averages lower than the established European averages. In this country the urea content of the urine averaged only from 9.5 to 11.4 parts per thousand, and of the blood, below 0.35. Figures above or below in Colombia are termed pathological. Thirty patients with various psychopathies are analyzed from these norms. The urea content of the blood was always high in the severer cases and in the exacerbations of all forms. In one case of a confusional psychopathy with stupor, the blood contained 0.56 per thousand, but as the patient improved, it dropped to 0.32. Azotemia was a constant finding in the depressed manics.

Hartung, E. LATE RECOVERY OF A PSYCHOSIS. [Zschr. f. d. ges. Neur. u. Psych., Vol. LXXX, Nos. 1-4.]

This was a case of catatonia diagnosed by the author as manic-depressive psychosis. After twenty-two years of necessary confinement in an institution the patient has been socially active for two years without any pathological manifestations.

Mott, F. W. MENTAL HYGIENE IN RELATION TO INSANITY AND ITS TREATMENT. [An Address delivered on October 10, 1922, to the Students' Medical Society, Charing Cross Hospital, London.]

The author advocates the treatment of early mental cases without certification. He points out that this treatment was adopted in the army during the war, and subsequently by the ministry of pensions. He notes, however, that it will be necessary to have an alteration in the existing laws, for the voluntary boarder, however dangerous he may be to himself or others, cannot be kept under restraint in a mental hospital against his wish at present for more than twenty-four hours. He next directs attention to existing mental hospitals and the treatment of early cases. He is of opinion that all cases not definitely diagnosable as incurable if sent to a county or borough asylum be received in a hospital apart from the main building. Every mental hospital should have an out-patient clinic attached, or better affiliated with a clinic outside the asylum grounds, and especially adapted and equipped for the treatment of early mental cases. He next calls attention to the valuable work done by the National Committee of Mental Hygiene of the United States of America.

Particular attention is directed in this address to the value of scientifically conducted research in hospitals and laboratories into the causes, prevention, and treatment of insanity by skilled properly paid medical

officers and social workers, and the author points out the fact that the war has shown the great need of systematic teaching in psychological medicine. He observes that the difficulty regarding the treatment by the ministry of pensions of ex-service men in asylums arose from the fact that a large number of potential lunatics were admitted into the army, and this might to a great extent have been avoided had medical men known more about incipient mental disease. He refers to the fact that Sir George Newman in an admirable report on medical education in 1920 stated, "It is deplorable that the English student of medicine should have no opportunity of learning methods of psychiatry or of diagnosing incipient and undeveloped cases of mental disease." The author alludes to the fact that as early as 1907 he advocated granting a diploma of psychological medicine and the establishment of a psychiatric clinic in London where incipient and borderland cases could be treated, and a little later this led to the late Dr. Maudsley approaching the London County Council, through him, with an offer of £30,000 if that body would build a hospital for the treatment of early mental cases, and for the study and teaching of mental disease. The scheme took a long time to mature, and the hospital, which bears Maudsley's name, was not completed when the war broke out. However, in 1916 it was completed, and both during the war, and since, it has fulfilled those portions of its function which relate to research and teaching. Five systematic courses of instruction in psychological medicine have been given there. The author advocates a central research laboratory for groups of mental hospitals. He alludes to the necessity of varying the diet in mental hospitals so as to avoid monotony. Finally he calls attention to the therapeutic value of occupation with *interest*, and he concludes with the truism "Variety is the spice of life," but that is just what this institutional life does not provide. [Author's Abstract.]

4. MEDICO-LEGAL; SOCIAL.

Hames, Fred. COMPENSATION. [Jl. Med. Asso. of Georgia, July, 1922, Vol. XI, No. 7, p. 269.]

Compensation as a law became effective in Georgia March 1, 1921, and is a law primarily for those employed in industry. The law is wide in its scope and covers all cases of injury to employees while in their line of duty. The different purposes of the law are to compensate injured workmen for loss of members or for loss of time as a result of bodily injury, to provide for medical expenses within a limit and for all treatment in such injuries, also covers loss of life and permanent disability, the maximum payment in such cases being \$4,000 and in cases of death an allowance of \$100 for funeral expenses. To illustrate: Should a man lose a leg he would be entitled to one hundred and seventy-five weeks' compensation based on fifty per cent of his average earnings, not to be more than twelve dollars per week

and not under six dollars per week. The loss of other members is compensated for proportionately as are such injuries as would constitute a permanent partial disability. The type of injury varies anywhere from minor abrasions to the loss of members and life. The majority of cases are of a trivial nature and do not necessitate a loss of time. Some cases are not reported to the foreman or employer until they have become infected. We also have to deal with cases of supposed injury or malingerers and this is not an infrequent problem. I have had any number of cases in which no evidence of injury could be found, yet these employees will remain away from work anywhere from a few days to two or three months. A goodly proportion of this type of cases come in supposedly back injuries which, in my opinion, are the most difficult ones to disprove. Other difficult injuries are those supposedly of the ear and abdominal cases. Not infrequently are venereal cases charged by employees to some alleged accident. The causes of a great number of these industrial accidents, of course, are many and varied. Many are directly traceable to the absolute carelessness on the part of the employee, and I believe that this forms the largest percentage of the total. A great many of the accidents are caused by the faulty placing of employee as to his ability for the character of work that he is to do. An individual of the plodding type is placed upon piece work, when in reality he should be on day work or paid by the hour. We also have the opposite where the nervous energetic workman is placed where the plodder should be. The plodding type of individual in his effort to make a showing is often injured by the increased effort on his part and the same applies to the energetic and nervous individual in that he loses his incentive and becomes careless. Other frequent cases are in the improper guarding of machines. I have in mind one machine that in one year was responsible for the amputation or partial amputation of eighteen fingers. Poor lighting and wet floors are frequent causes and it is not infrequent that injuries of the feet come from the wearing of shoes from which the soles are worn away. Poorly constructed scaffolds also contribute their toll of injuries.

What is to be done for the prevention of these accidents? It is up to us as physicians to advise and educate employees in prevention of accidents and to coöperate with the employers in removing the source of frequent injury. It would not be amiss to have first aid and accident prevention lectures given the employees in the larger plants at regular periods, and I am of the opinion that it would be a good investment for the employer to have frequent casual examinations of his employees in reference to their health and frequent inspections of the sanitary and physical conditions of his plant. This law contemplates medical expense in a sum not to exceed \$100 which expense must be within the first thirty days. This \$100 is to cover all of the expense incidental to injury, such as hospital, ambulance, X-ray, etc. In a certain proportion of cases this is absolutely inadequate and we

face the problem of receiving no fee unless some special arrangement is made. It has been my experience that the insurance carrier or the employer will, in the majority of cases, authorize an additional sum where he can be shown that the employee will be benefited and that permanent disability will be lessened or done away with, which, of course, is a wise investment for him. There have been, however, many instances where the employer or insurance carrier has been taken advantage of and where the expense has been increased out of proportion to the injury. All bills are paid by the insurance company and we must remember that this charge is one incident to the charge paid the insurance company by the manufacturer for coverage. With an increase in his medical expense from the average upon which his rate is promulgated, he will have to pay an increased rate and we should consider always that it is our neighbor and our friend, the employer, that is in reality paying the medical expense. I cannot too strongly impress this fact, for in one or more states there has been a change in the law and no provision is made for the guaranteeing of medical expense and the doctor is forced to look to the workman himself for payment for his services. We should consider the fact that in handling these cases we have a practical guarantee of fees and should show consideration in our charges, and we should also remember that it is the purpose of the law that services for treating an injured workman should be in proportion to his station in society. The treatment of these cases resolves itself into the injury presented. We should bear in mind that all cases of industrial injury are potential charities; that is, if the workman is unable to resume his duties, it will not be a great while before he will become a public care and conservatism should be practiced in all cases. We should lend our greatest efforts to the saving of members and the prevention and treatment of deformities and permanent disabilities. We should bear in mind that in treating these cases in the majority of instances we have a most trusting patient and every effort should be made to make him comfortable and restore him to health. Every effort should be made at a proper diagnosis and the X-ray should be employed in all cases of suspected bone injury. Badly lacerated wounds of the fingers and hands should be thoroughly cleansed and the macerated tissues removed, tendons sutured and any open fractures reduced as soon after injury as it is possible to do so, and all wounds should be kept continuously moistened with 25 per cent listerine solution. If you will take injuries of this kind and properly splint them, it will be an exception in which amputation will be necessary. Personally, I believe that the open reduction of fractures where the soft tissues are badly damaged is wrong and that more conservative treatment is necessary if these cases are to be saved. In injuries to the soft parts all cases in which the skin is broken are treated as infected injuries from the beginning. I make it a rule to give all cases presented with punctured wounds and all cases of

traumatic amputation a preventive dose of tetanus antitoxin. This is an inexpensive procedure, but the prevention of one case of tetanus per year will more than pay for all the antitoxin used. In conclusion, I wish to make the appeal for more conservative treatment of industrial injuries and for closer attention to the detailed handling of injured workmen. Let us study these cases and strive to rehabilitate the injured workman. (Author's Abstract.)

Sabatucci, F. THE COCAIN SYNDROME. [Policlinico, Vol. XXIX, p. 235.]

This study of the cocain symptom complex based upon careful analysis of eighteen cases of acute and chronic type is well worth while.

Claude, H., and Borrel. SEXUAL PERVERSIONS AND HYPERGENITALISM. [Médecine, February, 1923.]

These authors show the relationships between hypergenitalism, as evidenced in somatic endocrinopathies, and antisocial acts. They discuss the problem of responsibility involved.

BOOK REVIEWS

Edgell, Beatrice. THEORIES OF MEMORY. [Oxford at the Clarendon Press, 1924.]

We appreciate more the value of this book as it lies in the author's critical discussion than in her own conclusions. This, however, is what she herself intended for her readers. Indeed, she writes frequently with an interrogation point and sometimes questions the validity of her own criticisms. Her final attempt to construct a psychological theory of memory leaves us with an unsupported framework in her evasion of the biological grounds which she seeks to explain away from the theories of others. The formal words, cognition and conation, with which she endeavors to fill her framework, rich as might be their significance if fully applied, fail to fathom the depths and express the functioning of a real genetic psychology which cannot stand on the plane of the purely psychical. Affectivity, which the author touches but lightly, promising more but with an unfulfilled promise, would bring the biology and the psychology in closer interrelation and aid at least in the solution of some of the difficulties which are left unsolved in other writers discussed. Dr. Edgell has most interestingly reviewed the approach which modern thought has made to psychological functioning as it appears in memory. Semon has found the basis of physical memory in physiochemical engrams; the behaviorists have emphasized the biological activity but failed to account for regulation or purposiveness introduced and to avoid the introspectionism they appear to deny; older writers have studied memory only as "matter of knowledge, not of conduct"; Bergson is a representative of a "panpsychism" which leaves unexplained mysteries. These are some of the suggestive expositions and criticisms of the book, which, if they do not always awaken agreement with Dr. Edgell's point of view, at least rouse stimulating question as to the relative value of these various theories in the pursuit of our knowledge of memory and our practical dealing with its problems.

Walsh, William S. THE MASTERY OF FEAR. [New York, E. P. Dutton & Company, New York, 1924.]

The nature of the material of this book in its presentation of facts, psychological and physiological, which pertain to fear is highly commendable: it covers a range of scientific truth which ought to do much to guide popular thought into wholesome channels of reality. The offering of advice as to the dissolution of fears and the release of one's self from their domination falls easily into the preceptive—which is of little value in correcting situations where morbid fears

control. Less of such advice would have kept the author in the more fruitful field of enlightenment where the problem is approached from the foundation up, and in which his book therefore performs its best service. Such vague concepts as that of "nervousness" control his thought to some degree and he neglects some important factors; for example, repression and resistance, two strongly dynamic elements which make it less easy to reach one's own fears in their unconscious sources than he makes it appear. Aside from some defects of this sort, evidence of failure to go far enough in the direction taken, the writing is of the kind to bring the members of the reading public to face the facts in their own mental life with the fears here interwoven and to grasp the relation of these fears to the need of adaptation to the environment and its demands. When the author discussed the protective function of fear in its original service, he might have made it less a primary instinct than a form of adaptation instinctively constructed and utilized protectively even in the so-called abnormal fears which apparently exert an unreasonable control. This would have come nearer to pointing the way into an understanding of their genesis and a realization of the need of a fundamental readjustment where this kind of protection would no longer be necessary. The chapter or two embracing the relation of fear to the sexual life may be mentioned as excellent in straightforward, instructive handling of the subject. This relation too could well have been pressed more fully into the explanation of the unconscious sources of fear.

Bose, Jagadis Chunder. *THE PHYSIOLOGY OF PHOTOSYNTHESIS.* With Sixty Illustrations. [Longmans, Green and Co., New York, Toronto, Bombay, Calcutta and Madras, 1924.]

The author has added to his many contributions upon the activity of plants a detailed exposition of experiments determining the facts of photosynthesis in a quantitative sense. This vital process of photosynthesis is not only, as the author states, "one of the fundamental cosmic processes," important because it underlies the great primitive industry of agriculture, but of interest also as a manifestation of the great law of capture, storage, and release of energy so important in the activity of all life, plant or animal, physical or psychical. "The fundamental importance of photosynthesis is, that it is the process by which the plant absorbs the energy it requires, the radiant energy of sunlight, and stores it in the form of latent or potential energy in the organic products of the process. The energy so stored can readily be set free again and become kinetic, by the chemical decomposition of the organic substances, manifesting itself in heat, electric current or movement." The author gives in detail his technical procedure with a brief summary of each chapter which keeps the reader in close touch with the practical import of the experimental data. His broad and, we might say, sympathetic conception of this essential life process make the book of particular value to the specialist in plant growth or to the investigator of any form of vital functioning in its relation to healthful effective activity.

Ceni, Carlo. *THE BRAIN AND MATERNAL FUNCTIONS. Experiments in Comparative Physiology and Psychology in Two Volumes.* [From the Clinic for Mental and Nervous Disorders of the Royal University of Cagliari, Italy.]

The study of psychobiology which aims at finding the relation between animal and human life, is so full of difficulties as to justify any attempt to clear this obscure problem. These difficulties consist mainly in properly determining the importance and correlation between external and internal stimuli and between those arising in the conscious mind and the unconscious. The volumes which the author has written are the fruit of those comparative researches which he continued for several years in an endeavor to elucidate, especially in the light of psychology, the maternal functions.

The research leads into the field of anatomy and physiology and attempts to correlate psychic and material phenomena and to make general deductions from the most complex and most highly evolved functions of man.

Very few psychologists, or even spiritualists, limit the term psychic to only that which succeeds in projecting itself upon our consciousness as a result of introspective observation. Even Richet, who is of the opinion that such introspection cannot have any other objective but the knowing of the individual, concludes that the science of psychology must avail itself of objective studies, of experiences and of introspective observations depending upon the study at hand.

The intimate relation between psychic phenomena and the ordinary thought processes which go on in the brain should be enough to establish the fact that all the activities of this organ must be considered as closely allied. No definite distinction can be made between the phenomena which are the result of autoinvestigation and external or objective phenomena. For example, the activities of the brain, psychic and otherwise, either conscious or unconscious, are subject to the cerebral circulation. The composition of the blood has also an important influence on the nutrition of the brain and upon its many functions. It is also equally well known that cerebral lesions in man are followed by the abolition or alteration of objective or subjective phenomena, and that the one is so obviously related to the other that modern psychology cannot consider them separately. For this reason the nervous processes can be divided into visceral and psychic, the former being the vegetative life of the animal, while the latter are the animal's life in relation to everything else and include the subjective and objective phenomena, both conscious and unconscious.

The separation of cause from effect, as pure psychology pretends to do, is no longer a tenable conception. The analytical method endeavoring to find a relationship between psychic and organic life forces itself into every psychological problem. To study this properly there is only one method: experimental comparative psychology, making use of the anatomic-physiological method, applied to species in various grades of evolution. The joining of psychology with

biology, in the sense already advocated by Alfred Giard, Haeckel and Sergi, that the psychic phenomena are psychologic phenomena, and that both are the products of physiological function, must therefore be the sign post pointing to scientific psychologic progress. With this idea alone in mind the author sets out to face the difficult problem of the psychic phenomena which are involved in the maternal functions, or the maternal instinct, attempting by experimental research and the observation of similar phenomena in man, to find a solution to the principal questions with which this instinct is tied up in the field of introspection. The "substratum" of psychic processes is the central nervous system. It is natural, therefore, that attention should be drawn particularly to the seat of those centers controlling the maternal instinct. The relation that this may have with the visceral functions of the mother and more particularly with mammary function are of secondary importance, yet they are invaluable in this study. Given the enormous importance which the endocrine glands have over psychic and organic functions, and, above all, over the maternal functions, the author studied the relations of the psychic functions with the maternal viscera. He studied, above all, the sexual organs, mainly because their importance has been thought to be due to a direct correlation between the maternal psychic and sexual phenomena to the extent of even considering them one and the same thing.

The first volume is devoted exclusively to the general question of the maternal instinct, to explaining the experimental research carried out on two species of vertebrates (birds and mammals), and to a résumé of the different experiences which enabled him to bring out the principal facts to prove the recurrent nature of the psychic phenomena, their relation with various nervous organs and their relation to maternal functions, more especially with the mammary function.

The author did not often extirpate both cerebral hemispheres in his experiments because the animals, with few exceptions, went into a condition of shock and died within a few days. He therefore had to confine himself mostly to partial mutilation of the brain which hens stand very well. Four hens which had had both cerebral hemispheres removed, after a period of traumatic shock, got well enough to perform the responsive movements described by Goltz which are in large measure reflex responses to visual, acoustic, tactile, pain and thermal sensations which reach the Thalamus, Optic Lobes, Medulla, etc. Recognition and evaluation of stimuli were impossible, so the animals did not feed themselves and remained indifferent in the presence of their brood of chicks—showing that the maternal instinct is impossible without the cerebrum. Mutilation of the cerebral cortex caused the hens to make errors of judgment which were never corrected and to perform foolish acts, such as trying to scratch for worms on stone, calling its brood to show the chicks food which did not exist, etc. Furthermore, the maternal instinct which ordinarily lasts 3 to 4 months, became exhausted

in about 40 days. From his many experiments he has come to the conclusion that the cerebral cortex has an inhibiting and coördinating effect on the maternal instincts. He also concludes from experiments on ablation of the Striato-Occipital Lobe, that it is the principal seat of the psychosensory faculty, especially for vision and hearing, and that the Striato-Temporal Lobe is somewhat similar to the former, but more concerned with hearing than with vision. In mammals, the cerebral cortex represents the only seat of the maternal instinct, and ablation of the cortex naturally destroyed that instinct.

He performed 22 experiments on hens and 87 on dogs in a most painstaking manner and followed them up with autopsies after minute study and observation.

The second volume is reserved for various questions of general scientific interest, biological, sociological, physiological and pathological, and above all, psychological, which are linked up with maternity. These are analyzed carefully from the objective standpoint. Before entering upon the questions of psychology, the author begins with a few considerations of the psychic activities of the vertebrates, giving the result of his own observations so that by better understanding the causes an attempt can be made to solve the more complex psychic phenomena. Each division is subdivided into chapters at the end of which there is a list of the principal references. The bibliography is fairly complete.

SUMMARY

The psychic and visceral maternal functions in the higher mammals are intimately connected with the cerebral cortex.

a. The visceral maternal mammary functions following trauma, show immediate and remote disturbances. The immediate disturbances are diminution or arrest of milk secretion, usually transitory, lasting as a rule 8 to 10 days. The remote disturbances are early cessation of mammary function, varying in different subjects, but seeming to bear a direct relation to amount of cortex destroyed. But even after trauma, as long as the breasts functioned the chemical composition of the milk remained normal. Only in cases of severe, diffuse damage to both hemispheres does one usually get immediate and permanent total arrest of secretion.

b. The maternal impulse is represented by the sum total of the psychic energies of the two hemispheres. For this reason the parts of the hemisphere destroyed cannot be compensated for by the corresponding part of the opposite hemisphere. The entire cerebral cortex takes active part in the psychic phenomenon but in two different ways which correspond with the opposite ends of the brain.

The anterior polar region (prefrontal and frontal lobes) represent the preformed psychic phenomena which make up the maternal impulse. A lesion in this region immediately brings about the partial or complete disappearance of the maternal impulse, which may actually change into a hatred for its offspring. The animal becomes slow in its movements, changes its character and often becomes unsocial, threatening and bad tempered.

The posterior polar region (sensory spheres) represents the source of the psychic phenomena which serve to stimulate and bring to life the maternal impulse. A lesion of this region does not immediately produce changes in the maternal impulse, but only a slow and progressive weakening or an early exhaustion of it. The animal remains healthy and affectionate, but usually becomes dull, of poor memory, and unreliable in its action.

The mid-dorsal region of the cerebral hemisphere (the parietal lobe) serves to connect the two polar regions, but lacking a well defined function of its own, it therefore partakes in the activities of both polar systems. The destruction of this region alone does not cause, at least in the dog, much noteworthy residual disturbance, either instinctive or intellectual, whereas its destruction together with one of the two polar regions appreciably aggravates the symptomatic picture.

There is lacking every causative connection between the breast function and the maternal feeling (sense). The visceral and psychic phenomena develop and grow independently of each other, being regulated only by the same law of periodicity.

The bilateral extirpation of the thyroparathyroid apparatus does not modify the maternal psychic phenomena which continue practically unchanged up to the time that the animal falls a victim to convulsive seizures, characteristically following such operative procedure. The unilateral extirpation does not affect the maternal impulse which continues strong and unchanged for the entire natural maternal period. The breast function the first month after operation remains unchanged and only after that might it decrease (two cases out of three), so that the milk secretion remains insufficient for the nutrition of its product of conception, thus confirming the observations made by Hertoghe, Spolverini, etc. Therefore, it would seem to be a plain hypoactivity of the glandular organs, without any actual influence upon the length of their period of functioning. Thus it can be stated that there is no direct interglandular influence but that there is an indirect action by way of the central nervous system.

The love of offspring is one of the results of the sexual life, an instinct which develops in consequence of the union of the two sexes. The impulse of reproduction cannot be conceived physiologically as necessarily connected with sexual functions nor with the organic processes which are the immediate result of the sexual union. The function of the mammary gland has nothing to do with the maternal impulse. The love of offspring has its origin in an independent internal source, which not only has nothing to do directly with any of the other phenomena of procreation, but which lives in contrast to it and continues in open opposition to sexual instincts and functions. This instinctive faculty, which is independent of all the organs of internal secretion and which has a peculiar property of resistance against even the most serious organic metabolic disturbances, rises above the phenomena of procreation. The singular tendency to separate itself from the various physiological processes of the vegeta-

tive maternal life, shows that it is a purely psychic phenomenon, maintaining an independent existence and continuing rigidly unchangeable in degree, yet mouldable according to the necessities or demands of either environment or species.

These peculiar characteristics of a psychic energy (force), powerful, irresistible, autonomic, not changeable in degree, but changeable in form, and opposed to all the psychic and vegetative forces connected with procreation, have their seat in the nervous system which represents the anatomical sources and means by which they are transmitted atavistically.

The centers for this atavistic force (from the beginning), are especially represented by the more highly developed part of the central nervous system, in the cephaloid ganglia, in the invertebrates, and higher up in the scale we find them localized in the forebrain in vertebrates. In birds this force is scattered throughout the cerebral hemispheres, especially in the corpus striatum and tending to concentrate itself in the posterior polar region (occipitotemporal lobe). These centers form the anatomical ground work of any innate psychic function, the different elements of which maintain a physiological autonomy.

In the more cephalic portion of the anterior polar region lie the atavistic energies of altruistic and affective character which urge the mother to nurse and protect its offspring. These energies are under the control of the stimuli which especially come from the posterior lobes of the brain and which serve to stimulate and bring to life these finer characteristics which otherwise would remain latent. The peculiar localization of the innate maternal energies in the frontal regions of the brain, in common with the highest psychic functions, thus facilitates the maternal activities. Because of its location it is under easy domination and control of the individual's intelligence, thus making it possible in the case of man to elevate it to a point of being the most noble and the most highly evolved of human sentiments. Through the same psychic arrangement the congenital energies may be subordinated to the evil influences of environment, so that a woman may descend to the very lowest level possible in the human race, becoming a slave to the egotistical sentiments of a false civilization, even going as far as killing her offspring. Natural laws may be affected by abnormal factors which may strike directly at the anatomical basis of these individual tendencies and poison, so to speak, the very source of the altruistic sentiments, making of the woman a monstrous mixture of egotism and lust, incapable of feeling the joy of motherhood and contrary to the idea of propagating the species. However it may be, the fact that the entire cerebral cortex participates directly or indirectly in bringing about the maternal function, would seem to show that the mother needs to bring to bear all her organic potentialities for the preservation of the species. From all this, it naturally follows that it is an indisputable fact that the mother's sentiment towards the offspring is of a higher degree than that of the father, and that this is not to be attributed to

anything sexual but instead to the psychic personality or still better to the intimate and close organic configuration of the brain. For the same organic reason love, and affection in general, are more alive, more real, more warm, more imperious, and more palpitating in woman than in man.

It is the brain of woman which inherits the germ of this noble and important mission and not the mother who moulds it to the maternal purpose. However, it cannot be considered as an organ different in origin from that of man, in whom the essential tendencies, however different and opposed, nevertheless, assist the mother in her mission of procreation and conservation of the species. The feminine and masculine energies compensate and complement each other and therefore their differentiation in the two sexes cannot be absolute, but is only relative and varies in degree.

From what the author has stated one must logically deduce that the mother love even in its most complete form, in its most elevated manifestations, cannot be considered a true sentiment in the real sense of the word, a true altruism, pure and genuine, which originates solely from a conscious and reasoning moral sense, but is instead a sentiment which springs up from a subjective feeling of morality, more imposed by nature than wished for by woman. The moral value of this sentiment is none the less increased by its very nature and by its particular genesis, which places it above all the other sentiments that enter into the great mystery of procreation. They, more subjugated to the organic laws, escape even more easily the control of consciousness, thus preventing them from elevating themselves to the level of superior sentiments and approaching the ideals of the ego.

The mission of the mother does not correspond just simply to a duty which a provident and wise nature has entrusted to her in a manner most imperative, molding it in the supreme interest of the species, but corresponds instead to a social warning which comes from moral consciousness. This lofty sentiment of duty and responsibility joined to the inexhaustible forces of generosity and of sacrifice, which nature infused in woman, suffices to lead up to the ideals and to procure the noble, and the most intense pleasures of psychic living.

The author has not overlooked any important research work in his collecting of the different groups of known facts which he has tried to evaluate and systematize so as to be of use in the great problem of psychogenesis. Even though he may not have succeeded to one's complete satisfaction, nevertheless he has shown the way along a line which is destined to lead to new conquests in the study of cerebral functions. V. GILIBERTI, New York.

Northridge, W. L. MODERN THEORIES OF THE UNCONSCIOUS.
[E. P. Dutton & Company, New York.]

Northridge's study of the development of a psychology of the unconscious follows this from its beginnings in ancient philosophy, through the speculations of the eighteenth century, and to its more

rapid and secure growth upon the foundations of modern empirical investigation. The review is written with unusual clearness and conciseness of statement and with fairness of mind toward the relative values of differing theories and their service to one another. The author wholeheartedly accepts psychoanalysis, though with some criticisms and preferences within its own field of variations. He would have some of its statements made with more definiteness, such as to the actual material of repression, whether idea or affect suffers or there is an involvement of both, and as to the relation of the pleasure and reality principles. Such criticisms can only bring about more careful thought and expression in regard to these matters. Indeed, we find the author working out his answers to these questions in the same manner in which Freud has explained them, but where much later writing has sometimes tended to render them less clear. The obscurity which the author feels still surrounds the distinctions between the ego and sexual instincts might well be subjected to the light of Freud's latest monographs, which the author does not cite. Northridge calls attention to the confusion which has been introduced, chiefly by Rivers, in regard to "repression" and "suppression," and points out a definite distinction between them. He subjects to critical examination the modifications introduced into psychoanalysis by Rivers as well as the more extensive ones of Jung. He inclines in some particulars to these but not in all. He bears emphatic testimony to the practical value of psychoanalysis, not only as the revealer of the mental life, in its thoroughgoing and far-reaching psychological methods and theories, but as thus the servant of individual and domestic readjustment and happiness. Not the least important part of the book is that devoted to the study of the modern theories of the "subconscious" and the "subliminal self," which have preceded or accompanied the progress of psychoanalysis. Psychoanalysis, the author believes, supersedes these because it presses into actual scientific foundations. He believes that if fearlessly and correctly applied it will be able in such a field as that of the spiritistic and telepathic principles either truly to substantiate these or to discover where they are false.

OBITUARY

HUGO LIEPMANN, M.D., PH.D.

By the death of Hugo Liepmann Germany loses one of its most outstanding figures in neuropsychiatry. He died in May of this year and was sixty-two years of age.

Liepmann's training was in philosophy and it is partly due to this influence that his many works are rather large and at times were a



Le Professeur LEIPMANN (de Berlin)

little difficult to follow. He therefore never made quite the popular appeal that some of his Berlin confreres enjoyed.

After some years he entered the medical field and became first associated with Jolly in Berlin and later became associated with Wernicke in the Breslau Clinic. It was largely due to his contacts with Wernicke that gave the stamp to his later researches. After

leaving Breslau he became assistant physician at Dalldorf and in 1914 became director of the Mental Hospital at Herzberge where his career was interrupted by politics and he left and started private practice in Berlin in 1917. He was given the title of Professor ordinarius at the University and continued his research work. Of late years he had been ill with paralysis agitans and with a keen appreciation of the grim tragedy of a long drawn out illness he voluntarily chose to avert such an end by taking poison.

Most of his work has been centered around the problem of Aphasia and his special studies on Apraxia are classical. His work like his personality was characterized by a great seriousness and patient prolonged application. He never did anything slipshod.

Liepmann's work in the field of medicine took two directions: He made a special study of the destruction of acquired motor and sensory associations—the processes designated as apraxia, asymbolia, agnosia and auditory amnesia—and their localization in the brain; and he investigated certain symptoms of psychic disturbance by the application of the more refined psychologic methods, in order to ascertain their mode of origin and their import. Not only the first of his articles, which dealt with the production of visions, in persons delirious from alcohol, by pressure on the eyeball (1894), but all the following essays were distinguished by the broad range of view, the precision of the researches, the keen interpretation and the clearness of the presentation. His conceptions of the mode of origin of apraxia, which he confirmed by studies on the cadaver, led him to the theory of the dominance of the left half of the brain, which, under certain circumstances, might become disastrous for the individual and which one should endeavor to counteract by ambidextrous training. He erected approaches to other fields of clinical psychiatry by his articles on echolalia (1900) and on disturbances of conduct in mental patients (1905). His articles on flight of ideas (1903–1904), in which he set up a disturbance of the power of attention as the essential basis of hallucination, and his essays on the determination of psychopathic constitutions, are also worthy of note.

N. B.—All business communications should be made to Journal of Nervous and Mental Disease, 64 West 56th St., New York.

All editorial communications should be made to Dr. Smith Ely Jelliffe, Managing Editor, 64 West 56th St., New York.

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ORIGINAL ARTICLES

ON BRAINS WITH TOTAL AND PARTIAL LACK OF THE CORPUS CALLOSUM AND ON THE NATURE OF THE LONGITUDINAL CALLOSAL BUNDLE

BY DR. CORNELIA DE LANGE

PHYSICIAN TO THE EMMA HOSPITAL FOR SICK CHILDREN IN AMSTERDAM

The clinical data about the patient without a corpus callosum are as follows:

The child, a boy, was received at the Hospital for Sick Children at the age of seven weeks; he stayed there until death in his fifth month. He was the fifth child of healthy parents; in his mother's family nervous diseases are frequent. Another child died of pneumonia. The patient was born in asphyxia and did not increase in weight, though he was breast-fed; the taking of the bottle in hospital often met with difficulties, because his breathing was oppressed then. The child cries in a curious way, and in the mother's opinion he is somewhat strange and slow in his movements. On entering the hospital he weighs 2,020 grams. On our medical staff the child also makes a strange impression; he resembles more or less a case of myxedema; has the same hard and harsh voice which is so characteristic of infants suffering from this disease. The forehead is very narrow and retreating; the temporal fossae are both sunken. The inspiration is somewhat difficult, as if there is an obstacle in the nasopharynx. Heart, lungs, and abdomen are normal. The hands are somewhat in pronation and continually moving about (as if playing the piano). The child is slightly hypertonic.

After taking the feeding bottle the child often becomes blue, not on the face, which generally keeps its normal color, but on the rest of the head, which assumes a dark blue hue. The number of red corpuscles is 5,800,000; Wassermann's test proves negative; the fundus oculi is normal. An examination of the skull by X-rays is also negative. So is the result of the urine examination. Though the weight slightly increases, the child does not thrive and continues to make a not wholly normal impression. One may say, perhaps, there is something in cerebro and (or caused by

[From the Central Institute for Brain Research, Amsterdam.]

this) a disturbance in the internal secretions. The child often has a vacant stare, but always perceives the approach of the feeding bottle. Nystagmoid movements appear on the eyes. Slowly the little patient is passing away; in the end pneumonia comes and then the child succumbs almost suddenly.

The post-mortem is made by Dr. Schippers thirteen hours after death. There is no rigor mortis and there are no livores mortis. The subcutaneous fat has almost disappeared. There is a high degree of tympanitis of the abdomen. The pericardium is adherent to the sternum. The heart is not enlarged and shows nothing abnormal, only the wall of the left ventricle is somewhat thicker than usual. In both lobes of the left lung, but most marked in the lower lobe, are several foci of pneumonia; there are also hemorrhages under the pleura. The right lower lobe is solid; in the upper lobe a confluent bronchopneumonia is evident. The thyroid gland is small; so is the thymus. In the spleen only a small number of malpighian corpuscles is visible, no status lymphaticus being present. The medulla of the right adrenal is very thin. The pancreas has a normal appearance; so have the liver and the kidneys. The cerebrum is hyperemic, very soft, and edematous.

It seemed of interest to make a microscopic examination of the organs of internal secretion, though one cannot hope much from it, for it must be borne in mind that we do not possess sufficient exact knowledge, founded on a number of investigations as to the normal state of these organs during the first months following birth. Marked anomalies can be recognized, however.

Hypophysis cerebri, horizontal series: The pars anterior contains only a small number of chromophile cells, but this must be considered normal at this age. In the follicles of the pars intermedia only a very small quantity of colloid may be seen, free colloid being absent. The neurohypophysis seems to be rather small, but I was not in a position to compare preparations of a normal child of this age.

The thyroid body contains almost no colloid. The connective tissue has not increased; the blood vessels are very engorged. There are no degenerated parts. The follicles and the lobules vary very much in size. The follicle epithelium is low; the follicles show in different parts desquamated epithelium. It appears that there are rather many "amas épithéliaux pleins," but it is often difficult to distinguish them from follicles, which are cut tangentially.

Thymus: There is not a pronounced difference between cortex and medulla. The lobules are generally small, the connective tissue septa broad. There are perhaps less concentric corpuscles than is considered normal. Most of them show a central hornification. Some are very large and have hornified cells in cavities. There is no adipose tissue between the lobules. Eosinophile cells are present in a rather large number. Among the lymphocytes of the central parts involution forms do not present themselves.

In the adrenals the regression stage of the primary reticularis is still present.

The pancreas is slightly hyperemic. The insulae of Langerhans are

well developed and their number has not diminished. Of the centroacinar cells little or nothing can be seen, but the same holds true of the control sections of a normal child of the same age.

CONCLUSION: It may be said that there are slight anomalies in the pituitary and thyroid bodies and in the thymus, but, as has been mentioned above, not much can be concluded from these results.

In the Central Institute for Brain Research the cerebrum was first macroscopically examined and described. Hardened in formalin its weight is 686 grams (*i.e.*, 100 gr. more than normal). An extensive polygyria and the absence of the corpus callosum are striking. The olfactory nerves and bulbs cannot be discovered. The pons was removed from the brain by

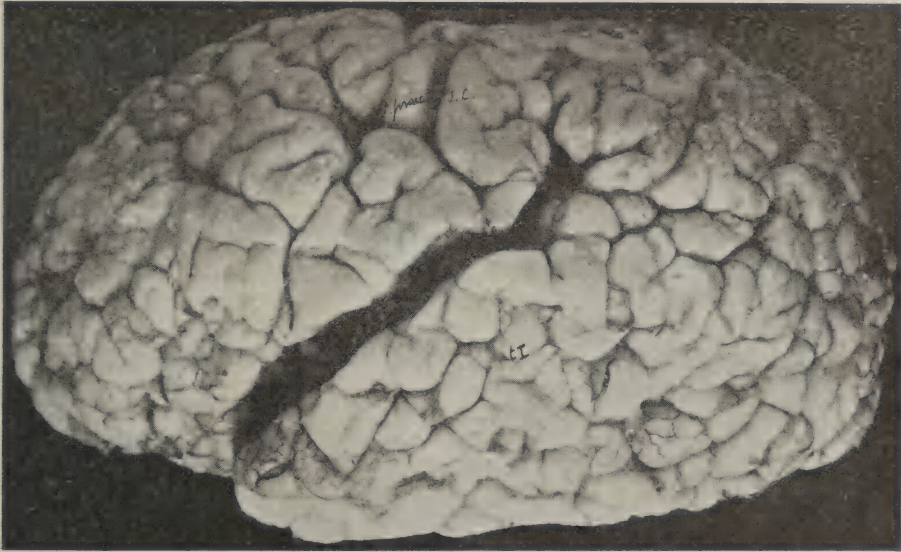


FIGURE 1. Convexity of Left Hemisphere.

cutting through the pedes pedunculi, and the bulb and cerebellum were put into Müller's solution for further investigation. The dimension from frontal to occipital pole is 14 cm. on both sides; the maximum breadth over both hemispheres being 12.5 cm. Macroscopically there is no apparent difference in size between the two hemispheres. In the cerebellum and the pons there is nothing abnormal. The brain, especially its occipital part, is rather flabby, as is the case in hydrocephalus. On the mesial section nothing can be detected of the corpus callosum and the septum pellucidum (in the microscopic investigation the pedunculus septi proves to be present). The fornix is found on both sides, the left one being not so easily traced as the right one. At first sight one has the impression that both fornices are connected on the ventral side, but the microscopic sections prove that surmise to be wrong. The pia was removed from the left hemisphere and left intact on the right one.

Description of the Convexity of the Left Hemisphere. The

fissura Sylvii has a normal appearance, is rather deep; in its foremost part a small surface of the insula is lying free. In a control preparation of a normal child almost four months old the operculum proved closed.

The sulcus centralis can be easily recognized, is not interrupted, and ends bifurcated near the mesial surface. The sulcus precentralis has two parts; the upper one, the sulcus precentralis superior, cuts the mesial surface. The sulcus precentralis inferior appears normal; the first one is three times the size of the latter. The upper half of the gyrus centralis anterior is smooth and normal. In the lower half, however, several small gyri are present; the lower half is smaller than the upper one. A sulcus precentralis transversus can be traced.

The sulcus centralis posterior is normal but its lower part is broken to a certain degree.

The sulcus intraparietalis proceeds from the sulcus centralis posterior and is well developed; is interrupted at one point and ends in a sulcus lunatus (ape fissure). The lobus parietalis superior contains a large number of secondary fissures, which cannot be determined precisely, and make the surface look like cauliflower. The same is true of the occipital part of the brain, where, however, a sulcus occipitalis inferior may be recognized.

The gyrus supramarginalis and the gyrus angularis have become totally polygyric. The sulcus frontalis superior cannot be traced with certainty, as there are two longitudinal fissures present which originate quite near the sulcus precentralis superior. A sulcus frontalis medius is present, so is the inferior sulcus frontalis, which originates from the sulcus precentralis inferior in the usual way. The operculum triangulare with the ramus anterior ascendens of the fissure of Sylvius and the ramus horizontalis can be easily traced, the foot of the operculum triangulare being somewhat broader than usual. The pars triangularis itself is markedly polygyric; so is almost the whole lateral side of the frontal lobe with the exception of the dorsal posterior part of the gyrus frontalis superior, which borders upon the sulcus precentralis. This part, too, is smooth, like the dorsal half of the gyrus centralis anterior. The topography of the nonpolygyric part of the frontal lobe nearly corresponds with field 6 of Brodmann, inasmuch as the latter is lying in the frontal lobe. The superior and middle temporal gyri can be easily recognized. Here also polygyria is present, as is the case in the temporal pole. The gyrus temporalis inferior is normal.

Mesial Aspect of the Left Hemisphere. The sulcus callosomarginalis is clearly present, but instead of being stretched, consists

of many oblique, sometimes rather perpendicular parts, and in the middle is interrupted over a very brief space. It is repeatedly cut by transversal fissures. The sulcus paracentralis is present. The lobus paracentralis, when compared with that of a normal child of the same age, is practically not polygyric. The gyrus cinguli is, dorsally and frontally, extraordinarily broad, and is subdivided into numerous convolutions which are lacking in a normal brain. The lobus frontalis superior is also, on the mesial side, markedly polygyric. It is not easy to limit the cuneus, the sulcus parieto-occipitalis being very

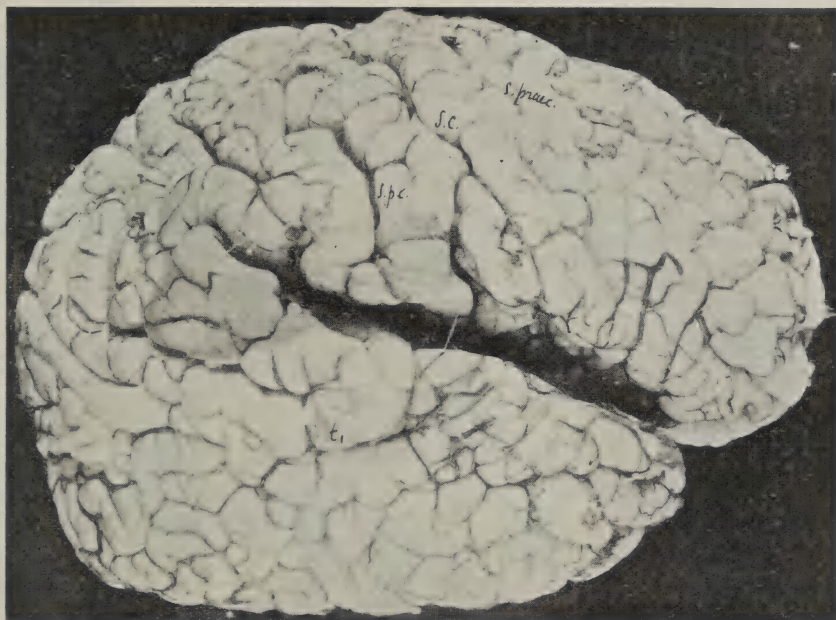


FIGURE 2. Convexity of Right Hemisphere, with pia.

deep, continuing on the convexity of the brain and ventrally nearly reaching the thalamic border. As for the fissura calcarina two horizontal fissures must be considered, between which there is only a small distance. Very probably the dorsal one is the calcarine, as this one is bifurcated and only just attains the dorsal surface. The calcarine is interrupted in its posterior fourth part. Neither this fissure nor the more ventral one running parallel to it reach the ventral border of the mesial hemisphere. Consequently the fissura parieto-occipitalis and the calcarine remain separated and do not meet as is normally the case in man.¹ The cuneus is very large and more fissured than normal.

¹ The separation of these two fissures is often found in the simian brain.

Basal Surface of the Left Hemisphere. Ventral to the calcarine, the collateral is evident; so the fissure mentioned above proves to be really the calcarine fissure. The sulcus occipito-temporalis is normal, but there is some polygyria in the convolutions between it and the collateral. The gyrus temporalis inferior is normal, the gyrus fusiformis being polygyric again. Whether the uncus is free from polygyria cannot be decided, as the cerebrum has been slightly damaged here.

Right Hemisphere with Pia, Convexity. The general configuration is the same as on the left side. The fossa Sylvii is very marked;

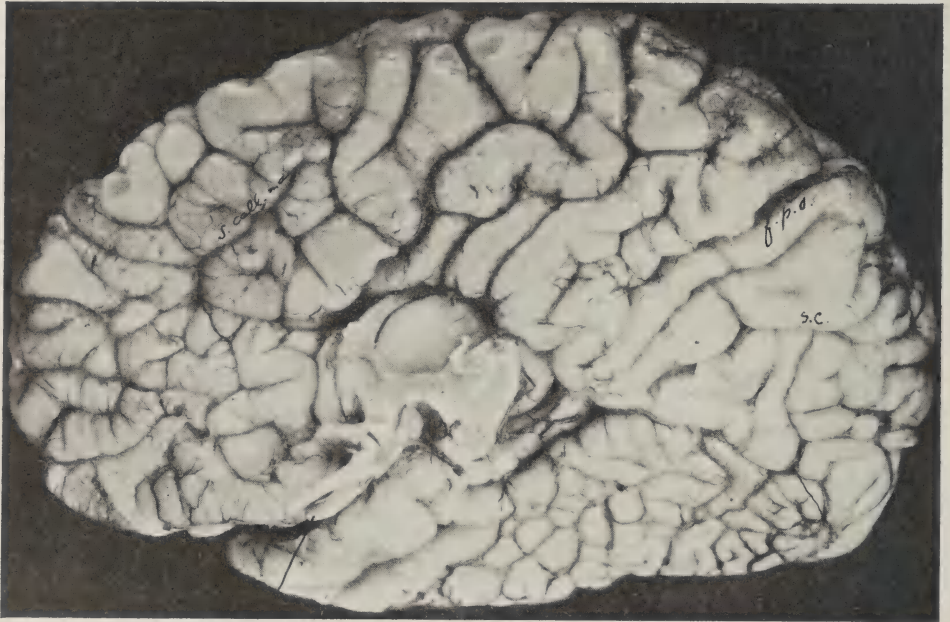


FIGURE 3. Mesial Wall Right Hemisphere.

its anterior part has remained uncovered, exhibiting a small part of the insula. The sulcus centralis is easily traceable; it cuts rather deeply into the fissura Sylvii with a ramus posterior and on the dorsal side just reaches the summit without indenting the mesial side. The post-central superior sulcus is also very marked; a very small portion of its dorsal part indents the mesial wall and is separated by a bridging convolution from the post-central inferior sulcus. The gyrus centralis posterior is totally polygyric. It is difficult to trace the sulcus precentralis as such, but it appears to consist of the two pieces out of which it has originated, a dorsal and a ventral piece separated by a bridging convolution.

Contrary to the other side, the whole gyrus centralis anterior is polygyric. In the frontal lobe a gyrus frontalis superior and inferior can be traced, but such a marked polygyria is present over the whole frontal region that a certain diagnosis is not possible in this pia-covered hemisphere. As for the operculum a number of fissures is present, which might be considered as ramus ascendens and ramus horizontalis of the fissure of Sylvius. In the parieto-occipital lobe a typical sulcus intraparietalis is not present, but there are several smaller fissures over the whole parietal convexity, especially near the mesial wall, but also ventrally near the fissura Sylvii. Also the angular and supramarginal convolutions are polygyric. In the occipital part the most striking feature is a very deep and broad fissure which indents from the dorsal side the sulcus temporalis inferior and almost separates the whole occipital lobe from the parietal region. It appears, however, that this fissure is no simian fissure, the latter being always situated farther backwards. This deep fissure gives the impression of a sulcus parieto-occipitalis lateralis, being present on the lateral wall (sulcus gyri transversi primi).

On the Mesial Wall of the Right Hemisphere the sulcus callosomarginalis is very undulated and interrupted in its middle portion. The gyrus cinguli is strikingly broad and shows some very deep and also some superficial sulci. The lobus paracentralis is not markedly polygyric. The frontal lobe shows a large number of convolutions, also on its mesial side. The calcarine is very deep and indents the mesial margin of the brain. The fissura parieto-occipitalis has a normal aspect, only it does not meet with the calcarine. The cuneus is much smaller than on the left side, but without doubt it is distended in a fronto-occipital direction. An anterior bridging convolution (gyrus cuneo-lingualis Cunningham) is present.

Base of the Right Hemisphere. The region of the uncus is free from polygyria, which is the more striking since the surrounding convolutions are so polygyric. A sulcus collateralis is plainly seen, reaching far frontally in the region of the gyrus hippocampi. The lobus lingualis is polygyric. The sulcus temporalis inferior is deep.

The chiasma was separated from the brain and imbedded for examination. The epiphysis could not be found.

Considering the macroscopic appearance of cerebra without a corpus callosum, one is struck by many small peculiarities, varying in each case; yet certain anomalies are constantly found. The latter are present in our case, too, viz.: the fornices remain separated over their whole course; the septum is lacking, with the exception of its oldest precommissural part; the gyrus cinguli and the fissura

calloso-marginalis are repeatedly interrupted by radial sulci; the calcarine does not meet the parieto-occipitalis. Also the olfactory bulbs and nerves are lacking; the same fact has several times been mentioned in the literature.

Moreover, our case presents in the configuration of the brain surface a number of anomalies, which are characteristic of a low stage of development reminiscent of simian characteristics, as appears from the above description.

The microscopic investigation was made in the following way: The whole *left* hemisphere was cut into serial sections of 40 μ ; every fourth section was kept and alternately stained after Weigert-Pal and van Gieson. The bulb and cerebellum were treated in the same way, the sections measuring 33 μ . Of the chiasma all sections were kept.

At first the *right* hemisphere was preserved *in toto*, but afterwards its middle part was cut and stained in the same way as described above, in order to ascertain whether the course of fornix and callosal bundle were alike on both sides. Here every tenth section was kept. It may here be stated that fornix and callosal bundle behave in the same way on both sides.

The left hemisphere was cut transversely into three parts. A high degree of hydrops of the posterior horns was apparent. A part of the glomus of the cornu posterius was imbedded in paraffine and the sections stained with hemotoxylin-eosine.

For the investigation of the cortex paraffine preparations of 10 μ were made and stained after Nissl with cresylviolet and toluidin-blue. On the *left* side the gyrus centralis anterior, the gyrus frontalis superior, the regio calcarina and the gyrus temporalis primus were examined. On the *right* side: gyrus centralis anterior (area of the face and the leg), gyrus centralis posterior (region of the arm), regio calcarina, gyrus temporalis secundus and tertius, gyrus frontalis superior near the mesian side and on the mesian side near the frontal pole, gyrus frontalis medius, pars triangularis (markedly polygyric), lobus parietalis superior (field 7, Brodmann) uncus, gyrus fusiformis (markedly polygyric), lobus lingualis, gyrus cinguli anterior and posterior part, gyrus occipitalis tertius.

Conclusions Concerning the Cortex. Inflammation or traces of it can nowhere be found. *Over the whole cortex an internal granular layer is present.* It is very strongly developed in the gyrus temporalis superior, lobus lingualis, and gyrus fusiformis. The gyrus cinguli contains a granularis interna layer in its posterior as well as in its anterior part, which latter normally is without one. The internal

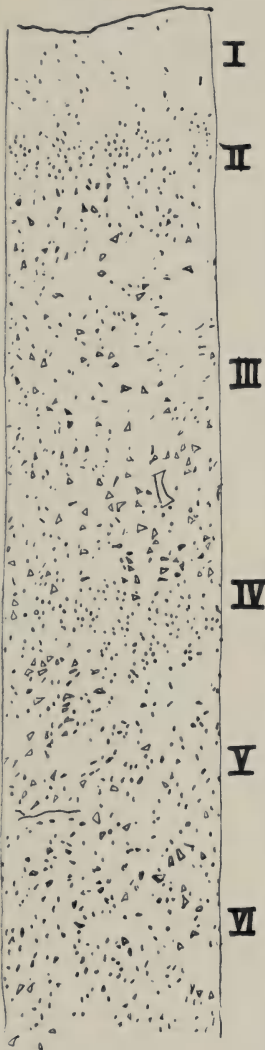


FIGURE 4.
g. fusiformis.

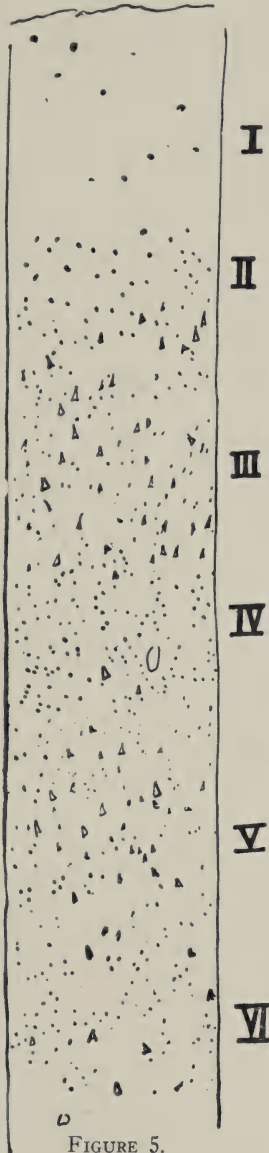


FIGURE 5.
field 7.

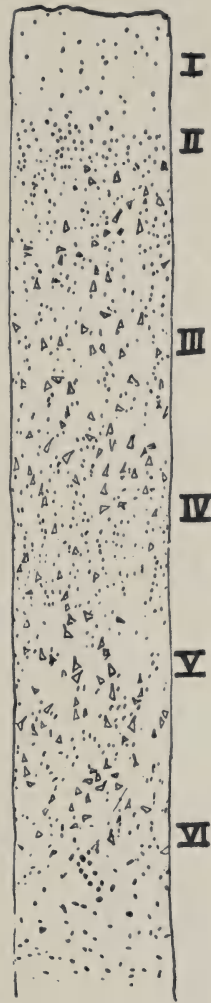


FIGURE 6.
p. triangularis.

granular layer of the anterior part of the gyrus cinguli is thin and contains pyramidal cells in some spots. The left gyrus centralis anterior has a broader granularis interna than the right one; on the right side more pyramidal cells are present in the internal granular layer than on the left. The calcarine has one very broad internal

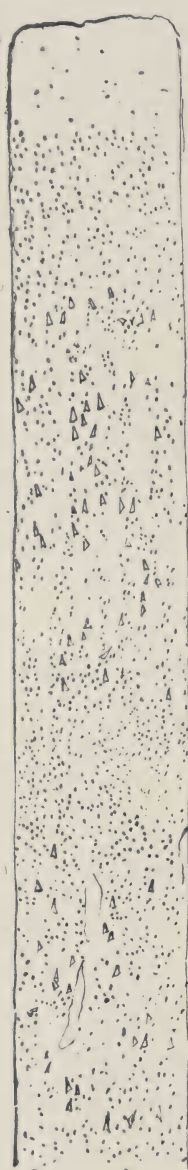


FIGURE 7.
g. lingualis.

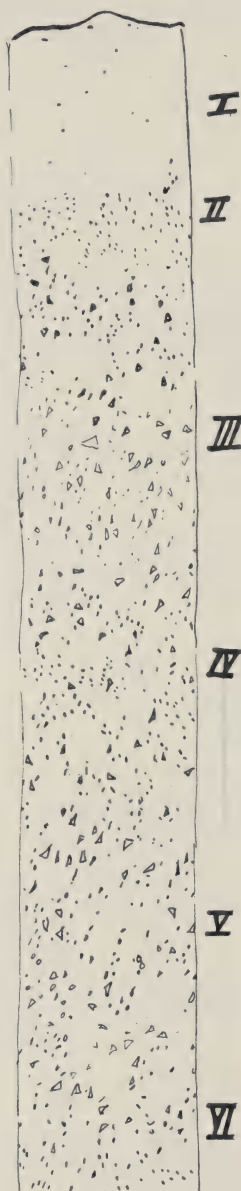


FIGURE 8.
g. front. med.

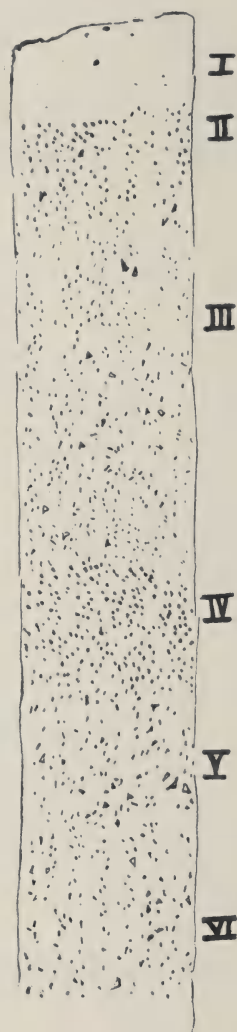


FIGURE 9.
calcarina.

granular layer, the separation of which in three layers not having yet occurred. The uncus has a rather thin internal granular layer, but there are many large pyramidal cells in the layers V and VI.

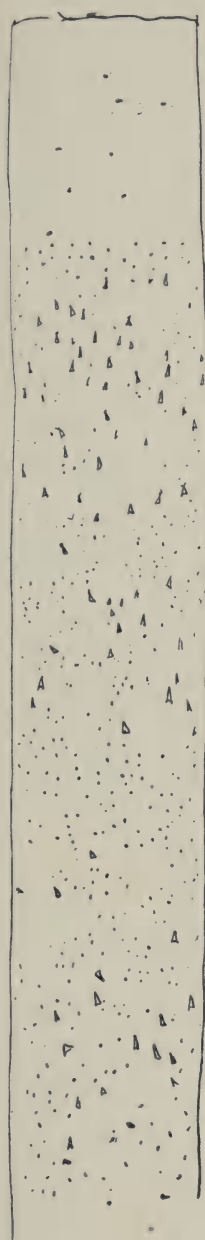


FIGURE 10.
gyrus centr. ant.



FIGURE 11.
g. cing. p. ant.

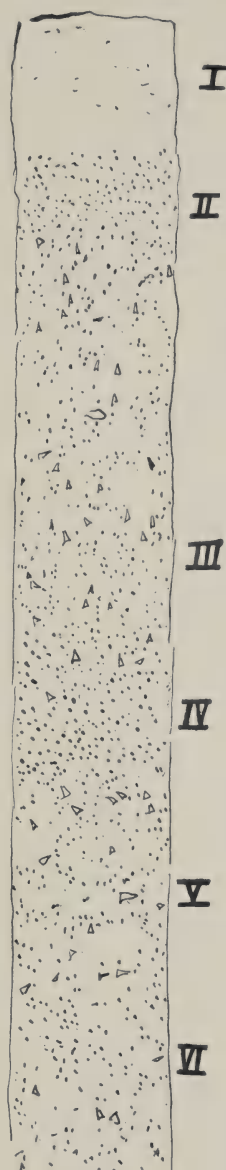


FIGURE 12.
g. centr. post.

In field 7 of Brodmann the pyramidal cells in the third layer show a tendency to arrange themselves in vertical columns. This is not so in the rest of the cortex.

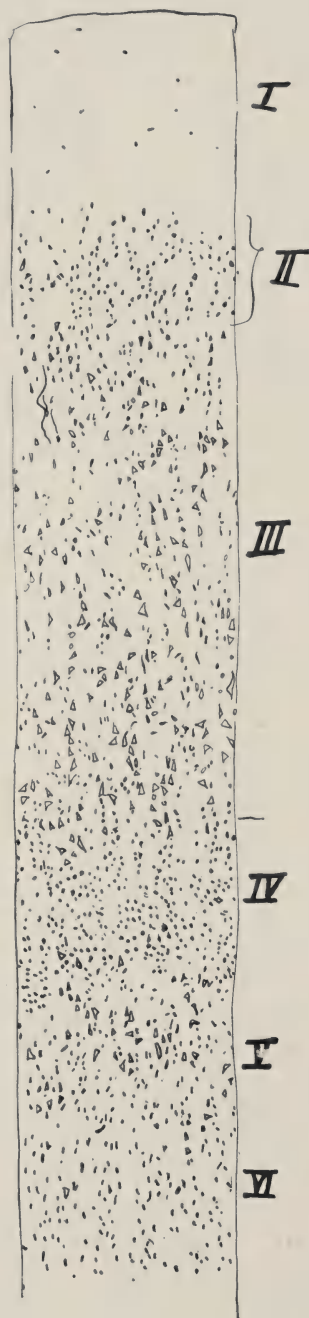


FIGURE 13. gyrus temp. sup.

In preparations of a normal child of about four months old the gyrus centralis anterior was not wholly without an internal granular layer; the same was true of the anterior part of the gyrus cinguli, but in the cerebrum without a corpus callosum the layer was much more distinct. As for the calcarine in the normal child three layers could not be distinguished with certainty, but the separation was in progress and two layers were distinctly visible.

There are parts in the cortex of the brain without callosum in which the layers V and VI are poor in pyramidal cells (for instance, gyrus fusiformis, gyrus frontalis medius), but this is by no means the case in the whole cortex. It is not possible, therefore, to verify the relation between callosal fibers and the infragranular pyramids in this brain. Van Valkenburg (23) says the same: "Observations on the cortical cells in cases of agenesis of the corpus callosum permit of no conclusions."

As the macroscopic description of the cerebrum has shown an extensive polygyria is present. In these polygyric regions a minor development of the layers V and VI is repeatedly found, but this does not hold good for the whole cortex.

What is remarkable in our case, and has not been described as yet in agenesis of the callosum, is the inhibition in the development of the cortex, resulting in the presence of the internal granular layer in the whole brain and the granularis interna of the calcarine not being divided into three different layers. According to Brodmann (3) this separation occurs normally in a seven months fetus.

Rondoni (20) investigated in several cases of idiocy the gyrus centralis anterior and always found an internal granular layer. It may be mentioned, by the way, that in the figure which Rondoni gives of the gyrus centralis anterior of a normal child two months old, a granularis interna is present.

As a result of his comparative investigations Kappers (1) has come to the conclusion that, apart from the zonal layer, the neocortex consists of two functionally different regions, the supragranular part (lamina 2 and 3 of Brodmann) being principally associative, receptive-sensible; whereas the infragranular is mainly corticofugal and commissural. The lamina granularis interna (IV) is, according to Kappers, also receptive. This was confirmed by Van 't Hoog (11) who measured the cortex of the regio post-centralis in such a way that from the same order of mammals a small and a large representative were chosen, *e.g.*, Griffon and St. Bernhard's dog, cat and lion. The supragranular layers of the large animal always proved to be broader than the corresponding layers of the

smaller animal, and this increase happened to be at the expense of the internal granular layer. Secondly, he was able to state that in higher mammals the supragranular layers become more developed.

In the macroscopic description of the brain without a callosum attention was drawn to the fact that its configuration in several respects was simian-like. So it was not without interest to find out whether some resemblance to this might also be found in the relation of the supra- and infra-granular regions of the cortex. For this purpose preparations of 10 μ were made and stained with cresylviolet of the cortex of a normal child with a brain weight of 550 grams. When this brain was presented to the Institute the age of the child was said to be five months. This, however, seems hardly credible; probably the child's age was not more than four months. The supra-granular layers in the brain without the callosum were in the same measure or even more developed than in this somewhat younger child, as is shown below:

		Normal	Without corpus callosum
Gyrus fusiformis	{ Zonalis.	1.3	1.8
	{ Supragranular layers.	5.5	8.
	{ Granular.	2.2	2.5
	{ Infragranular layers.	5.3	5.
Gyrus cinguli	{ Zonalis.	1.6	2.7
	{ Supragranular layers.	5.5	6.3
	{ Granular.	2.4	3.
	{ Infragranular layers	5.5à6	6.5
Gyrus temp. sup.	{ Zonalis.	2.	3.
	{ Supragranular layers.	6.5	9.8
	{ Granular.	1.3	2.8
	{ Infragranular layers.	5.5	4.5

The age difference being not more than one month, one may say with certainty that a notable retardation cannot be present in the development of the layers in the child without a corpus callosum.

This also indicates that the granularis interna in the brain without the corpus callosum is broader than in the normal child. If one compares the cortex of the child without a corpus callosum with preparations of a normal adult, the supragranular layers in the latter prove to be more or in the same measure developed as in the former.

The preparations of the tela chorioidea of the cornu posterius were rather good. Investigations of later years taught us to regard the plexus choroideus as a gland which secretes into the ventricle, but also brings material to the blood and lymph channels and can also act as a barrier for the nervous system. So this "placenta

cerebralis" is of great interest pathologically in cases of hydrocephalus ventriculorum. The plexus in our case, however, looked normal; after a careful study one was even able to detect a very few cilia.

The bulb, cerebellum and optic chiasma proved normal on microscopic investigation. The opticus was well myelinated.

The monograph of Mingazzini (17) on the corpus callosum deals in its fourth chapter with the agenesis. The list of literature references which belongs to this chapter contains 84 numbers, but does not mention the cases of Drossaers (7) (from Winkler's laboratory)

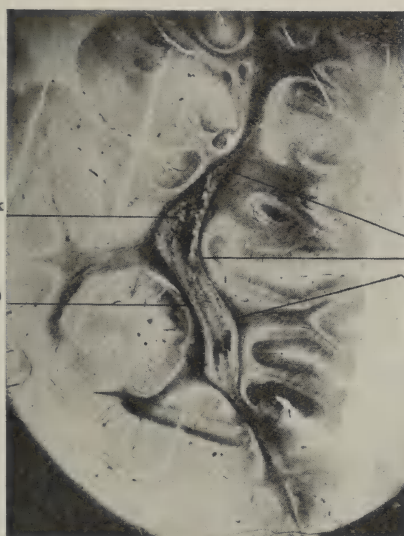


FIGURE 14. Anterior Horn.

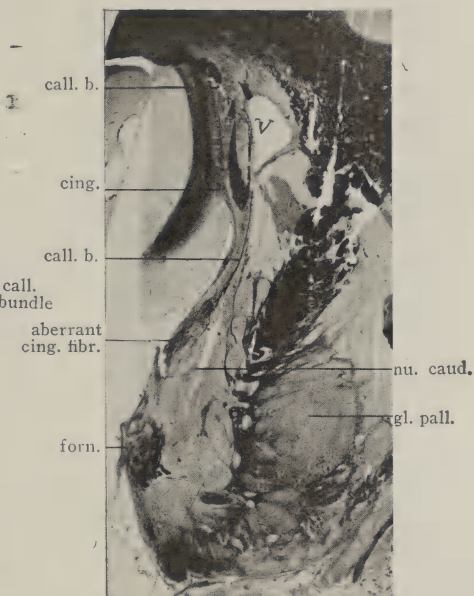


FIGURE 15. Frontal Sect.
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and of Hultkrantz (12). To complete I will add the very careful investigation of Tumbelaka¹ (22) of the brain without callosum found in a *Cebus hypoleucus*. Mingazzini himself observed two cases, and in his book relates a third one not previously published. Three cases therefore, by the same author. This fact might give an erroneous idea of the frequency of this anomaly; so it must be stated that according to Mingazzini only 71 cases of agenesis of the callosum have been published. In 43 of these, there was a total or almost total defect; in 28 a partial or rudimentary atrophy.

Among the cases thoroughly investigated, macroscopically as well

¹ Then assistant to the Central Institute for Brain Research, Amsterdam.

as microscopically, belong those of Probst (19), Banchi (2), Marchand (16) and Drossaers. After having studied their work and my own serial sections I have come to the conclusion that the so-called "Balkenlängsbundel," which can be traced in my case, can in every respect be compared with that of the said authors. In my opinion it would therefore be useless to describe my preparations in detail, the more so as otherwise there are no anomalies, especially not in the nucleus caudatus, nucleus lentiformis and thalamus. A short résumé and some figures ¹ (Figs.14-18) may suffice. On study-

forc. maj. call. b.



FIGURE 16. Just Behind 15.



FIGURE 17. Behind 16.

ing the figures, one must keep in mind that, the brain being that of a five-months-old child, part of the fibers are not yet medullated (*vide* Flechsig's (9) atlas).

The course of the callosal bundle which since Probst is generally called "Balkenlängsbündel" (Banchi speaks of fascio longitudinale mediale) is as follows: Beginning at the frontal pole the callosal bundle is already present before the cornu anterius becomes visible in the preparations. The fibers of this bundle are running ventrally to the orbital convolutions. Further on the bundle runs on the mesial side of the ventricle and on the lateral side of the cingulum. According to Drossaers' description the fibers turn round the dorsal

¹N. B. Figs. 15 and 17 have been taken on the reverse side.

summit of the ventricle and reach its lateral angle. This cannot be clearly seen in my preparations of the frontal part, but on approaching the occipital part, it becomes distinct. In all preparations the anterior horn appears to be very small; the same is seen in Marchand's case. The callosal bundle touches the caput nuclei caudati, remaining clearly distinguishable, however. On going somewhat further in an occipital direction a space is seen between the callosal bundle and the nucleus caudatus, the ventricle continuing as a small slit. Some of the fibers of the callosal bundle go into the pedunculus septi, as does the olfactory bundle. The fornix longus is situated on the lateral side of the callosal bundle (in Banchi's figures it appears to be on the mesial side; in the figures of the other authors on the lateral side); the stria Lancisii is lying on its mesial side. In a fronto-occipital direction the callosal bundle first increases in size, afterwards it becomes thinner. Its dimensions are greatest at the level of the chiasma. The fibers of the callosal bundle run sagittally for the greater part; at its top, arcuated fibers can be seen, as well as perforating ones. During a part of its course the sagittal fibers are united in a sharply limited area; this is very distinct in those sections where the nucleus ruber is present. Very soon, *i.e.*, in a frontal direction in my preparations the underhorn opens, this being probably caused by its being distended in a high degree. The cornu ammonis appears to be small.

The ependyma of all the cornua is hypertrophied; fig. 14 shows this very clearly in the cornu anterius. The fornix runs into the fimbria and becomes detached from the callosal bundle exactly in the same way as described and drawn by Marchand. The large black mass which in Weigert-Pal preparations is normally formed by the forceps corporis callosi is practically absent. It is however possible to distinguish a thin forceps major and forceps minor bundle, which together form the callosal bundle and of which the forceps major runs into the lateral tapetum of the cornu posterius, the minor into the mesial one. At the end a thin layer of fibers on the mesial wall of the ventricle can be seen forming the rest of the callosal bundle. The "*faisceau occipito-frontal*" of Dejerine, *sive fasciculus longitudinalis medialis*, is always distinct in my preparations, as is the *stratum subcallosum*.

In some cases of brain without a corpus callosum the commissura anterior was abnormally well developed. In my case it was normal, so were the posterior and medial commissures.

All authors agree that the callosal bundle contains fibers proceed-

ing from the different lobes and reaching it on its antero-posterior course, but as to the nature of the bundle opinions widely differ.

Marchand sums up the various opinions in the following way:

I. The callosal bundle is a normal bundle which becomes more distinctly visible by the lack of the callosal fibers.

a. It may be identified with the fasciculus longus superior of Burdach or fronto-occipital association bundle (Onufrowicz, Kaufmann, Hochhaus).

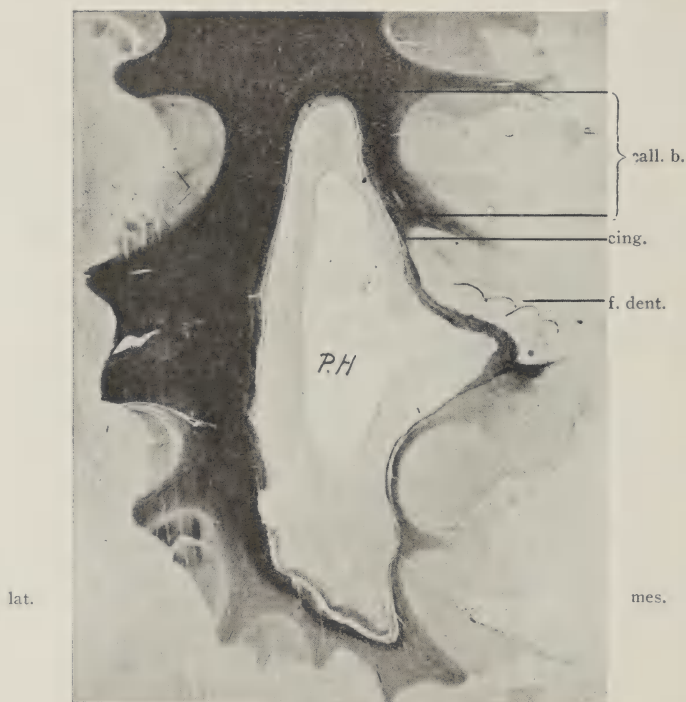


FIGURE 18. P. H. = Posterior Horn.

b. It may be identified with the "retikuliertes Stabkranzfeld" of Sachs, cortico-caudal bundle of Obersteiner and Redlich or fasciculus fronto-occipitalis of Dejerine.

c. It is identical with the fasciculus nuclei caudati (fasciculus longus medialis) (Anton and Zingerle).

d. The callosal bundle comes from the septum formation (Bruce).

e. It is formed by a stronger development of normal associative fiber bundles, viz, fronto-parieto-occipital bundles, parieto-frontal bundles and a third also parieto-frontal bundle, the latter of which

may be identified with the fornix longus; all three of them contribute in forming the fascio longitudinale mediale (Banchi) or callosal bundle.

II. The callosal bundle consists totally or partially of callosal fibers, which instead of crossing from one side to the other, run in a sagittal direction and in this way represent a well formed associative system (Sachs, Mingazzini, Probst, Arndt and Sklarek and others).

Drossaers is of the opinion mentioned sub. II. Marchand's own opinion is expressed in the following words (page 481): In the main I agree with Banchi that the "Balkenlängsbündel" represents for its greater part an associative system between the frontal and occipital lobes, between the parietal and frontal lobes, probably also between the parietal and occipital lobes. Whereas, however, Banchi thinks that the whole lateral tapetum belongs to the bundle fronto-occipital of Dejerine, I am convinced that a greater part of the tapetum belongs normally to the corpus callosum, and the latter being absent, contributes towards the formation of the longitudinal callosal bundle. I will, however, readily grant that these details may vary in the different cases.

In studying the literature, one finds that the case of Onufrowicz (18) (Forel) is the first one, which has been rather accurately investigated, so we are obliged to discuss his opinion. It appears that Onufrowicz regards the callosal bundle, which he found and traced, as the fasciculus arcuatus (sive fasciculus longitudinalis superior, sive fasciculus Burdachi). Now this cannot be right, for the fasciculus arcuatus is lying much more laterally than the callosal bundle, the latter being well visible in his preparations. It may also be emphasized that the fasciculus longus superior does not continue into the tapetum, as Onufrowicz believes.

I am of opinion that none of the above cited authors furnishes sufficient arguments to convince one of the truth of his conclusions; nor does the investigation of my own case prove which is right and which is not. With our present knowledge of this system it is impossible to solve the problem.

After I had arrived at this negative conclusion Dr. Ariëns Kappers told me that in the collection of the Central Institute for Brain Research there was a museum piece of a brain with a thin frontal atrophic crossing callosal part and a broader noncrossing part, the latter exhibiting caudally exactly the form of a splenium (pseudosplenium in figs. 20, 21). The transition of the crossing into the noncrossing part corresponds with the level of the depressio corporis callosi (Kappers, 1a) in normal brains, which may be

found in the ideal elongation of the ramus ascendens fiss. calloso-marginalis. From this noncrossing part, fibers radiate into the cortex in the same way, as far as is macroscopically visible, as is the case in the normal splenium (fig. 19). This brain might bring us the solution of the problem. For, if the fibers of this pseudosplenium should appear to run in the same way in the posterior horn as in the brain, in which the callosum is lacking entirely and also in the same way as is the case in a normal brain, one may conclude with certainty that the longitudinal callosal bundle (so-called Balkenlängsbündel) really consists of callosal fibers having taken a sagittal instead of a transverse direction.

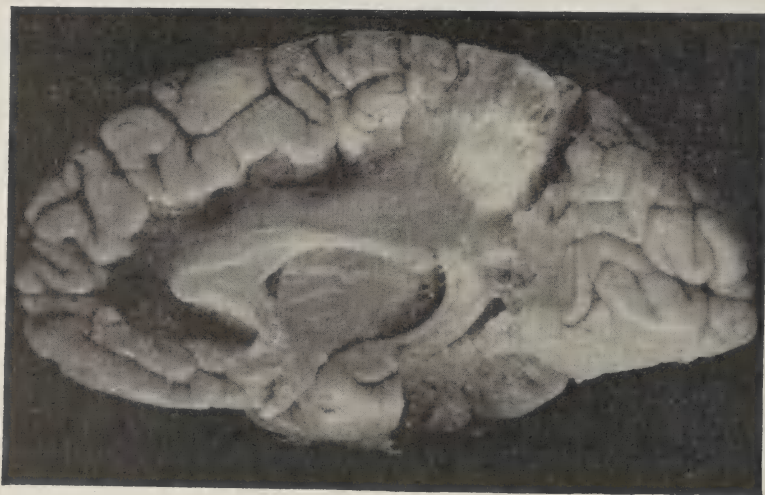


FIGURE 19. Normal Child 4 Months. Callosal Radiations.

Fig. 20 and fig. 21 represent the right and the left hemisphere of the brain with partial crossing. No details about this brain were known; it may only be said that it belonged to an adult. Originally destined for the museum, the hemispheres were separated and—to show better the condition of the septum—the thalamus had been removed. From the left hemisphere also the hippocampus was removed, while a slight gap occurred in the genu corporis callosi (fig. 21). Notwithstanding the fact that the material was very brittle, it was possible to obtain a frontal series of the left hemisphere, which enabled us to study the crossing and the noncrossing parts of the callosum. The sections measured $35\ \mu$; every tenth section was kept and stained after Weigert-Pal.

As may be seen from figures 22 and 23, the crossing part of

the callosum is thinner than usual, but otherwise normal. In fig. 24 we have reached the noncrossing part and in fig. 25 the pseudo-splenium. Figs. 26 and 27 show the fornix and fimbria approaching one another in the normal way. In fig. 28 we see that the forceps major is remarkable for its size, surpassing that of the pseudo-splenium, as well as for the fact that it is more than usually indented on its mesial side. The forceps major is seen passing into the tapetum laterale in the normal way, the forceps minor passing at its ventral end into the tapetum of the mesial wall of the ventricle. The forceps minor looks more like an appendix of the forceps major than as a sharply defined bundle. The cingulum is clearly visible through its

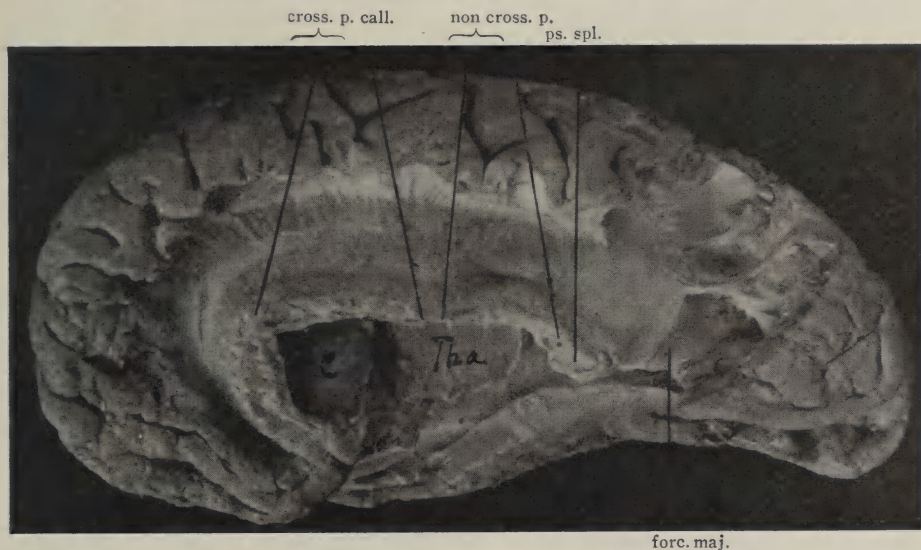


FIGURE 20. Partial Acallosal Brain. Callosal Radiations.

whole course, running as usual over the laterally spreading callosal fibers.

On comparing figures 22–30 with figures 14–18, the latter being of the brain entirely without corpus callosum, we are convinced that the fibers in the pseudo-splenium and in the posterior horn of the brain with the partial crossing run in exactly the same way as they do in the brain without corpus callosum. From this we may conclude that the longitudinal callosal bundle represents the noncrossing callosal fibers, and that those authors are wrong who identify it with a preëxisting but, normally, not visible system.

On studying the literature on the subject I did not meet with a similar case of partial crossing, so I believe such cases are rarely seen. Owing to the happy circumstance of one being present in the

Institute for Brain Research, the problem of the longitudinal callosal bundle could be solved.

Etiology in the Cases of Total Lack of the Corpus Callosum. The case of Banchi seems to be the only one where the absence of the corpus callosum was not associated with other important anomalies. One can understand, therefore, that Banchi sees the cause in a very circumscribed pathological process in the mesial side of the embryonic lamina terminalis. This simple explanation cannot be true for the other cases, however, for in them so many anomalies are present that we are forced, as also Drossaers writes, to consider the



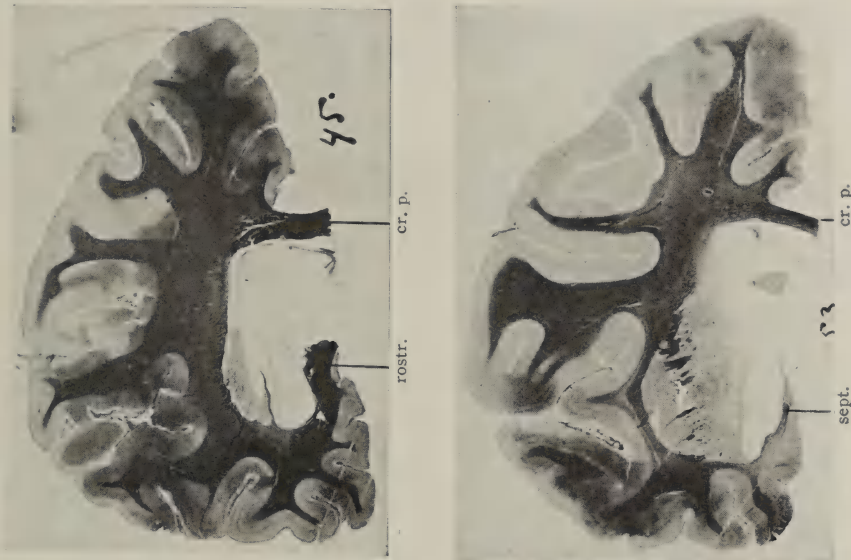
FIGURE 21. Partial Acallosal Brain. Callosal Radiations.

whole brain as a pathological product. In Stöcker's (21) case, where the patient died of juvenile paralysis, the spirochete must have been the cause, and Landsbergen (15) also thinks lues hereditaria in his case highly probable. This, however, leaves us still in the dark about the nature of the pathological process.

Several authors are inclined to look for the cause in the hydrocephalus internus, which, being almost constantly present, depends upon an endymenitis. By the pressure of this hydrocephalus the distance between the hemispheres enlarges and the crossing cannot occur. If traces of an endymenitis could *not* be found, it was assumed that one had been present formerly, which forms a new hypothesis. In most cases the hydrocephalus increases in a fronto-

occipital direction. After Drossaers, this hydrops is not a hydrops a vacuo, but the "pli cunéo-limbique" and the "plis cunéo-linguaux" of Dejerine otherwise deeply situated, now lying on the surface, it is certain that the ventricles have actively distended.

Moreover, Drossaers found a minor development of the occipito-temporal region, of the sagittal strata, the thalamic nuclei, and the corpus geniculatum externum. These circumstances all prove that the hydrops internus must have been present very early, and has had



FIGURES 22 and 23. Showing Crossing Part of Callosum.

a noxious influence upon the development of these parts. An ependymitis was absent in his case. An ependymitis and traces of it could be found in my case, but this may be secondary, since it is known that the deformed brain is prone to secondary inflammation. The above mentioned anomalies, which, according to Drossaers, are arguments for the active part of the hydrocephalus, were lacking in my case. So it is not sure that, in my case, the hydrocephalus was present in a very early stage, and, if it was not already present in the third fetal month, it cannot explain the absence of the corpus callosum.

In the case of agenesis of the corpus callosum described by Landsbergen, the left ventricle was not at all distended. This fact is not in favor of the mechanical theory.

One can also think of a chemical factor, the secreted fluid having

a nocuous influence by its composition. Moreover, it is curious to note that in some of the cases of agenesis of the callosum the olfactory nerves are lacking. Normally, there are pathways about the olfactory nerves giving an outlet for the cerebrospinal fluid into the nasal membrane (Weed, 24).

Not much attention has been paid to the examination of the plexus chorioideus. In Kaufmann's (14) case of total agenesis the

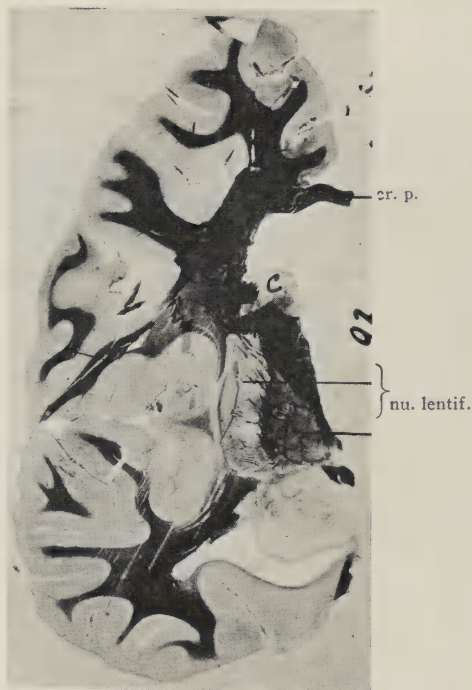


FIGURE 24. Callosal Crossing.

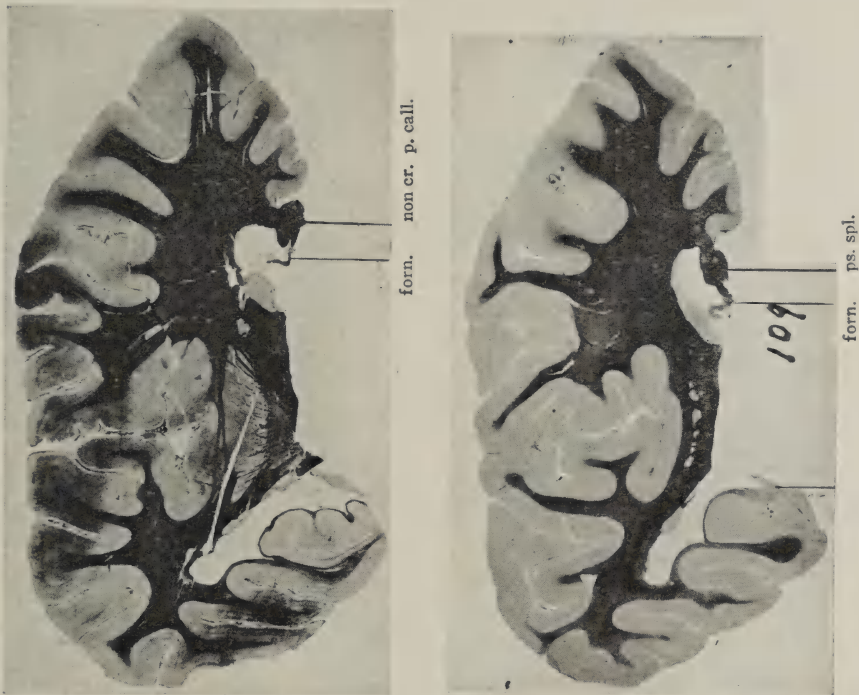
plexus of the third ventricle was lacking. In my case the preparations of the glomus showed nothing abnormal, there being especially no signs or traces of an inflammation.

For the present we can only suppose a lesion of the germ, though lues and alcohol can be excluded in our case.

The Intellectual Development of Individuals Without a Corpus Callosum. *A priori*, it is highly probable that the corpus callosum plays an important part in the higher functions. Now it is true that none of the persons without a callosum had more than a very mediocre intellect, but for the rest the intellectual status varies from individuals capable of producing only unintelligible sounds to prac-

tically normal ones. In several cases persons with the abnormal brain seem to have been rather short-tempered.

Foerg (10) alleges that he made the diagnosis of the absence of the callosum during the patient's life; it seems hardly credible, however. The agenesis being always a surprise at the necropsy, as a matter of course the neurological status is lacking in the *historiae vitae et morbi*. An exception is made by the case of Landsbergen. Here, however, a number of other anomalies were present; therefore



FIGURES 25 and 26. Noncrossing Part of Callosum.

no conclusion may be drawn from it as to the function of the corpus callosum.

Hultkrantz has put the question, In what way does the brain without callosum work? It is well known that in cases of agenesis of the corpus callosum a coördination of the muscles of both halves of the body is still possible, especially of both arms and both legs, also "*ein einheitliches Denken*." This fact can only be explained in supposing that one hemisphere has taken up the "*Antrieb*" and the finer regulation of all spontaneous movements, and that also the higher mnesic-associative functions are limited to this hemisphere,

whereas the other hemisphere is totally inactive, so to speak, "dumb." This does not imply that on the dumb side no physiological processes are occurring, but that they do not manifest themselves in the patient's actions. According to Hultkrantz, this hypothesis does not disagree with the present interpretation of the building and functions of the brain; perhaps systems which are normally already present now only reach a higher stage of perfection.

Hultkrantz holds the opinion that in his case the left hemisphere

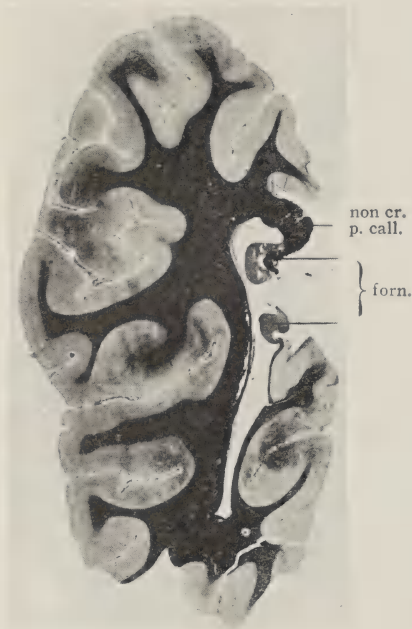


FIGURE 27.

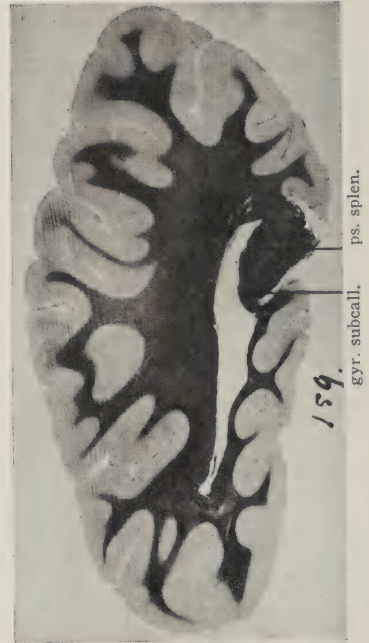


FIGURE 28.

prevailed, it being somewhat larger than the right one; moreover, the patient was right-handed.

On reviewing the literature one sees that really in the majority of cases there was a difference in size between the right and the left hemisphere, generally in favor of the right hemisphere, but it was not constantly present. In my case there was no marked difference as to the whole size, though the cuneus was on the left much larger than on the right. So no more can be said in favor of Hultkrantz's hypothesis.

I am greatly indebted to Dr. Ariëns Kappers, director, and to

Dr. B. Brouwer,³ subdirector of the Central Institute for Brain Research. Without their never-failing aid and interest an outsider in neurology like myself would never have been able to do this work.



FIGURE 29. Ending of Callosal Fibers.



FIGURE 30.

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COMMENTS ON SCHIZOPHRENIA

INCLUDING EXCERPTS OF A CASE

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If genetic interpretations of abnormal mental reactions, involving schizoid manifestations, are to survive the cold scrutiny of psychological appraisalment, the psychopathologist will be obliged, in order to render Freudian contentions understandable, to base his explanations of schizophrenic phenomena on observable facts rather than on intuitive theories, as has been the practice of many heretofore. Freud (1) and others advanced certain theories of psychotic behavior. Subsequent workers proceeded then to interpret obscure fragmentary thought processes in the neurosis in terms of these well supported, but none the less unproved, theories and cited Freud's suppositions as a foundation for their often far-fetched deductions which, in many cases, degenerated into mere expressions of their own personalities. The trouble consisted in their beginning at the wrong end. They should have observed the character of the unconscious in the light of that which was distinctly tangible, such as the talk of a deteriorated case of dementia precox, and should then have attempted to interpret disguised and highly symbolic thought content from the fruit of this observation, ever mindful of the pitfalls of necromancy.

The perusal of unconscious thought processes in the schizophrenic affords a most adequate means of thoroughly grasping the significance and the accuracy of Freudian conceptions of the polymorphoperverse infantile traits, which have been mercilessly flouted by those who did not take the trouble of exhaustively investigate. By this approach the psychiatrist avoids the blunders usually committed by the average psychoanalyst, who, especially if mystically inclined, assumes the enigmatical mien of the sorcerer and makes his ascension into the air castles of rabid symbol interpretations.

Upon occasions one may encounter the schizophrenic whose content is amazingly literal, and in whom the symbolized material is minimized to such a degree that one is enabled, by simple study of the spontaneous productions, to determine roughly the meaning of his suppressed thought. (I use "suppressed" advisedly, whether suppressed or what not, the productions consist of considerable

material which has not manifested itself heretofore in the conscious.) Obviously this material is that which has been rejected because of social barriers, as it contains just that which society taboos.

Jung (2) made a very detailed and careful study of the mechanisms of thought productions in the schizophrenic and very deftly demonstrated the similarity between the dream processes in the hysteric individual and the schizoid talk of the paranoid psychotic. It was unfortunate, however, that the author did not include even one stenogram in which the unconscious productions were unmasked. Had Jung seen fit to include examples of more literal, and less symbolic unconscious content, much of the subsequent misunderstanding and adverse comment regarding the original Freudian conceptions might have been avoided.

The case which suggested the preparation of this paper contains just the spontaneous and literal schizophrenic productions which are so indispensable in fathoming the nature of unconscious content. If one should never have heard of Freud's theories of sex and should, after studying the case presented in the paper, encounter say "Three Contributions of the Theory of Sex," he would be obliged to concede that the fragmentary unconscious word productions of this schizophrenic coincide essentially with Freud's descriptions of infantile phantasy at the autoerotic level.

GENERAL SURVEY OF THE CASE

The stenogram excerpts which were selected were taken from the patient's spontaneous talk and were unstimulated by word leads.

We shall call the case "Moe." Moe is a Russian Jew by birth, having come to this country at the age of seven. He is now approximately twenty-five. He entered the public school in New York City shortly after his arrival from Russia. He was immediately reported by the teachers as being unmanageable and was said to have continuously created disturbance by his raucous outbursts of laughter. He was forced from school to school, all strenuously objecting to the upsetting influences of Moe's inappropriate guffaws. Finally at thirteen, having made no appreciable progress in school, he was forced to give up his efforts in this direction. He displayed little aptitude for work and consequently shifted from one job to another and chose dogs as his chief companions. At intervals he was seized with periods of excitement in which he would alternately laugh and cry. At all times he would invent the most absurd accounts of his experiences. Finally he secured employment as a merchant seaman. In 1917, when the patient was eighteen, a fellow seaman one day accosted him on the street and apprised him of his mother's death. Moe, instead of reacting in a normal manner, burst into laughter. In spite of his behavior, he continued to work as a laborer on merchant boats. In 1920 he came home one day and accused his father of putting poison in his

coffee and asked that he be given more poison. He also would stand before the mirror and admire his physique and express his intentions of becoming a prizefighter. When he was taken to the Manhattan State Hospital, he said:

"Nothing is the matter with me—it is the wicked man that is responsible for it—my father is the wicked man—you know what he did to me—he put poison in my food and brought this condition—I was a nice son but he was a bad father." (It is important that his difficulties are projected on the father.) He continues, "I am alive—I suppose you think I am dead—I should have been dead—No, I cannot die—I am too young—it is nice and cold outside—it is nice and warm in here—my body is warm in here."

He was described as being untidy, noisy and destructive. He continued his schizophrenic talk:

"I heard them say I was Christ—my father is a bird—he is a wicked bird—he poisoned my body—now he wants to poison my spirit."

His condition according to the records remained essentially the same up until the time of his transfer to Saint Elizabeths Hospital March 6, 1925.

OBJECTIVE PHENOMENA IN CROSS-SECTION

Moe assumes, and almost continuously maintains, the fetal attitude, head on chest, eyes closed, knees as a rule flexed up under the chair in which he is sitting. He executes, at frequent intervals, rolling and rocking movements of the body and head. He sits for hours in this obviously satiated state, jabbering of incest and laughing and crooning in an unmistakably infantile manner. Storch,⁽³⁾ alluding to similar practices of Buddhist Indians, as described in the Rigveda, supplies us a very suitable explanation of these weird gyrations:

"The rolling of the head and the movements of the eyes, the rocking movements, and all strange attitudes and movements of the early Indian ecstatic customs were for the purpose of attaining an absorbed condition of consciousness fitted for the reception of ecstatic experiences."

We later learn that the patient's rhythmic swaying quite convincingly confirms Storch's interpretation, as he gabbles incest jargon throughout the execution of them. In these ecstatic states he likewise seems capable of excluding at times all outer stimuli impressions, resorting to masturbation in a most shameless fashion, utterly indifferent to the presence of the attendants and other patients. Simultaneously he talks fondly to the female tattooed image on his free arm; it, he addresses as mother, May and Maggie (the latter two names were later found to be those employed by the father in addressing his mother) in the following fashion:

"Give me a kiss, you pretty little May. I simply love my darling mother."

He then purses his lips in a most suggestive manner and protrudes and withdraws his tongue alternately, making erotic sucking noises. Saliva dribbles from his mouth. When he goes to a meal he ignores all utensils, grabs the food up in his hands and then laps it with his tongue, smearing it over his lips and allowing it to drool down on his chin and to soil his clothes. In the midst of this disorderly ordeal he bursts often into hilarious laughter. He obviously attaches considerable importance to the mouth. This is not only indicated by his erotic oral manipulations but also by his spontaneously expressed theories of its content and function about which he is in considerable doubt. He says:

"Of all the teeth (he points to one of the incisors) that one hurts me the most . . . because when I was a little boy my mother took my tooth out with pliers. Then she saw that I was a stupid Adam. She found that a little boy should have a bone. She then snatched my tonsils out." We now see the reason for his attaching so much importance to the mouth. It is clear that he believes himself to have been castrated by his mother. This belief is fully substantiated by his next statement:

"She's got to show me there is no such thing as *testes** in my mouth."

He becomes a "stupid Adam" in his mother's eyes after having been rendered impotent. She effected his enucleation, his imagination tells him, having foreseen that he would have been ineffectual in performing cohabitation. This, Freud contends, is the usual humiliation the infant son is obliged to undergo in the Oedipus situation. To all appearances Moe is fixed by very stout bonds at this period. All doubt of this being the case is banished when he expounds, unsolicited, the theory of his birth, just as does the infant in Freud's picture at the autoerotic level:

"I was born from the scum of my mother's mouth. I came with my eyes closed and couldn't see for three or four days. Then she beat me and bled me."

This bears out our suspicion that by a process of upward displacement he is substituting the buccal cavity and its content for the generative organs. The "scum" of his mother's mouth may possibly signify an ephoriation of the fetal amniotic encasement, as Sullivan (4) suggests, but any consideration of this question is purely speculative. He then continues his theorizing concerning the nature of the mouth content as follows:

"She took this bone (he indicates the incisor) and I can't give her no more bone. I make it come out my throat."

Stärke (5) elucidates, after a fashion, the rôle played by tooth-extraction in the mechanism of psychic castration. He says:

"The common derivation of the feeling of loss in the mouth and in the genitals from the withdrawal of the mother's nipple is explained by the fact that tooth-extracting ephoriated the old complex of sensation associated with the withdrawal of the nipple from the mouth, *i.e.*, castration, masturbation, etc."

Judging from the patient's production exclusively, it would seem apparent here that in the fancy of the autoerotic period he unconsciously realizes the futility of the incest wish and hence he will not only refrain from the attempt to cohabit but will spitefully ignore any difference between the sexes in order to avenge his disappointment. The schizophrenic at this level seeks to do this, according to Rank, (6) by employing exhibitionism as an expedient, *i.e.*, ". . . exposing himself with pleasurable infantile shamelessness which rests on the assumption of an unconscious denial of the differentiation of sex." Rank further points out that the homosexual likewise ignores sex differentiations. Just as was said in alluding to the patient's masturbatory propensities and his proneness to expose himself in a brazen fashion, Rank also points out that should the narcissism or the homosexuality be insufficient to overcome the sense of guilt for the incest wish, the individual will require punishment for

* Uses vulgar phrases.

the incest craving as did Moe when he said: "I was beat like a stupid dog."

Certainly the great majority of the ideas which Freud ascribes to the infant fantasy are demonstrable in this individual. The mechanism of the child's manner of coping with the *Œdipus* problem is amply illustrated and clarified by his theories of his own conception. As is rather frequently done by the hero in the myth which is just another form of puerile autistic thinking, Moe ignores his own father and proposes to substitute him. As Rank (7) shows, though, the hero of the myth usually assumes the disguise of another person, or better, creates, in a very vague fashion, a replica of himself, as did the improviser of Lohengrin saga. In the case of this particular schizophrenic, however, all trappings of a misleading nature have been avoided by the conscious, and he expounds the theory of his own birth in no unmistakable terms. In perfect congruity with the Freudian assumptions of infantile thought processes when the infant is confronted with the *Œdipus* problem, this patient asserts:

"My mother says that I was a beautiful boy. She says, 'Will you show me your beautiful black life?' I gave her my beautiful black life. I gave her my train, my locomotive (common dream symbols) and everything else. When she put her buza messhuga (crazy buzzer) to my twig of gold, I split her wide open—once my woman was rusty—it made no difference—I broke her (he uses slang phrase for violating virginity)—she played too much—I broke my God's vein in her. I said, 'What do you want me to do?' and she said, 'I'll make you a little red-headed boy.' I gave her a little red-headed baby and she fed me with bones and bare skin because she was my beautiful May. That red-headed baby's name was Moe."

This simple story is indefensible and it is inserted principally to remind the skeptical that these rejected and unthinkable incest notions of the infant period may figure rather prominently as causative entities in a later malignant mental disorder. Unfortunately, the narrative is rarely as complete as the present one; it is usually fragmentary and disconnected; it was labeled by archaic thinkers as "a lot of nonsense."

Accompanying this *Œdipus* story in the pure culture, we likewise apprehend the expression of other perverse traits alleged by Freud to be present at this level. Of these, exhibitionism, closely linked with the peeping tendencies, occupies a prominent place. In addition to displaying his genitals in a very shameless manner, the patient gives utterance to his desires to peep and also to exhibit as follows:

"She wanted me to watch her and see how many tricks she could do. That's how I used to watch her night after night. I liked to watch my mother's corsets. My mother watches me sometimes. She never leaves me take anything myself. Sometimes I watch the notch key to the closet—my mother says I was a beautiful boy. When she came to see me, she would

touch me and I didn't mind until she touched me too far up under my legs. She would show me many tricks, not because her face was sweet under the blankets. I tried to show her my 'artistic Peter Piper' and played to her every day."

"The covering of the body," Freud says, "which keeps abreast of civilization serves to arouse sexual inquisitiveness which always strives to restore for itself the sexual object by uncovering the hidden parts."

In spite of his castration ideas and his expressed feelings of impotency, Moe is persistently narcissistic. Ambivalence of the libido selections is not uncommon in infantile thinking. He turns the love energy on his own ego and beholds himself as a very prepossessing and altogether superior individual.

"She gave me medicine which made me very strong. They say that of all the human beings I was the greatest ammunitionist. She said I was a beautiful boy. I see visions that I was a great Chinese and she took my Chinese eyes and kissed me forever."

That this boy has psychically regressed to the nursing level can hardly be refuted even by the most glib of those who choose to deliberately ignore the possibility of such a regression; especially is this the case when he talks of nursing and executes simultaneously the motions with his lips. His productions dealing with this phenomenon run along about in this fashion:

"Every time you do something to me, my Maggie, I begin to (he uses slang phrase indicating that he began to execute the act of nursing) and I will (he here again asserts that he violated her) I'd say."

Concomitantly with the nourishing fantasies, he betrays the kinship of trauma and sexual pleasure when he says:

"I came with my eyes closed and couldn't see for three or four days, and then she beat me like a dog and bled me and I took my head of a monkey tree and gave her" (he states in vulgar language that he gave her all he had).

He then affords us a very nice illustration and analogy of the procedure which the infant mind employs in identifying its own being with trees and plants; this animistic thinking the infant mind has in common with that of the primitive. Frazer (8) amply elaborates the process in the pristine. The patient in identifying himself with trees and grasses says:

"I was once a lonesome grass—I saw I couldn't be a tree—better a tree than to run around like a poor little boy."

Analogously, Frazer alludes to this same animistic discrimination

in the religions of the American Indian and of some of the tribes of the Punjab. In concluding the subject he says:

"To the savage the world in general is animate, and trees and plants are no exception to the rule. To the shades of certain trees and plants consideration and respect is due . . . but the shades of grasses are of little account."

CONCLUDING REMARKS

The surprising part about this case is that in spite of all these overwhelming evidences of profound regression and hopeless emotional deviation, Moe makes remarks now and then that are uncommonly relevant, and in addition he plays a rather surprising game of checkers. Does this mean that in reality there has been no marked damaging of the original intellectual basis? Does it mean also that the sheer introversion of the emotion is responsible for the apparent intellectual impoverishment? It is at least of sufficient significance to incite extreme caution on the part of the psychiatrist before hastily rendering a verdict of either mental or emotional deterioration. Lewis (9) suggests emotional deviation as a substitute for emotional deterioration. Sullivan (10) is adopting a very skeptical attitude toward the alleged hopelessness of schizophrenia, more particularly that of the catatonic type. It may be possible that the outlook has certainly heretofore been unwarrantedly dismal. Now this patient is obviously fixed at the autoerotic level. What factors caused the development of this rigid bond of fixation can be only partially determined inasmuch as the mother is dead and the father can do but little toward throwing any light on the subject. It is enough for our purpose, however, to be able to present these phenomena, an understanding of which is so invaluable in grasping the significance of the unconscious. The many critics of psychoanalysis may assert to their heart's content that curing by psychotherapy is merely healing by suggestion and possibly be correct in certain instances; but when they attempt to deny the worth of Freud's explanations in reference to the content of the unconscious, then they betray the fact that they have at least refrained from making an extensive investigation of the subject. Conservative psychologists (so-called) of the McDougall type might be pleased to account for the spontaneous talk such as is shown in the above case, ignoring Freud.

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STUDIES ON DEMENTIA PRECOX

A STATISTICAL INVESTIGATION OF VARIOUS CONDITIONS WHICH MIGHT HAVE AFFECTED THE BRAIN BEFORE THE ONSET OF THE DISEASE

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INTRODUCTION

We have described the anatomy of the brain of dementia precox in the first report of our study. In the ninth of its conclusions we have remarked that there are pathological alterations in the brains of dementia precox which can not be regarded as changes due to dementia precox but should be considered as residuals of some other morbid processes which had taken place before the onset of the mental disturbance. These changes are developmental anomalies, hydrocephalus, pachymeningitis, meningoencephalitis, etc., and are observed in 35.8 per cent of the examined cases. The fact that these alterations are encountered in a considerable number of dementia precox brains seems to be something more than a mere coincidence. In order to get a clear insight into the pathological process of dementia precox we have undertaken to determine the significance of these alterations. This can be accomplished to a certain extent by the statistical study of the various clinical data found previous to the onset of dementia precox. These data which might have influenced the brain, may fall into the following categories:

1. *Heredity*

(a) Insanity of ancestors:

There is no doubt that a person having insane relatives often shows a predisposition, but it is erroneous if one overestimates it because there are a number of patients showing mental disturbances without any appreciable hereditary trends and *vice versa*. Another thing to be cautious about is the history given by laymen. This must be accurately investigated and the nature of the insanity should correctly be interpreted.

(b) Alcoholism of ancestors:

Alcoholism in family stem is important in two respects:

(1) The injurious effect of alcohol on germ plasma is recognized by many and has been proved by experimental studies carried out by various workers.

(2) Alcoholics are often found in the family of abnormal personalities and degenerates and therefore this indicates oftentimes pathological character of the members of the family. Alcoholics in the collaterals are also significant.

(c) Congenital syphilis: Syphilis, especially the congenital, is known to affect the brains of sufferers. Information concerning syphilis is not always reliable and care should be taken of abortus and premature birth of brothers and sisters as well as the syphilitic stigmata of the patient himself.

(d) Other conditions: (1) Nervous diseases can not be always looked upon as giving predisposition to mental disease of offspring. With exception of some obvious cases we do not place much importance on the nervous diseases of the ancestors in this particular study.

(2) Marriage of closely associated relatives. No definite theory has been given on the effect of the marriage of relatives on the offspring except in the case that many ancestors had practiced it successively. The same can be said of the intermarriage between different nationalities.

(3) Tuberculosis: Offspring of tuberculous parents often manifest physical and mental weakness in childhood but can not be considered as always giving a predisposition to mental diseases.

2. *Intrauterine Period*

It is hardly necessary to mention that the abnormal conditions of mother during the pregnancy would affect the future development of child. None falls into this category in present statistics.

3. *Children's Period*

Convulsions in childhood, poor bodily development, retarded beginning of walk and speech, night terror, somnambulisms, nocturnal enuresis, hydrocephalus, meningitis, infectious diseases, trauma in head, etc., are considered to be significant. The intellectual development in childhood is also of import, because there are a number of dementia precox cases developing on the base of idiocy. Therefore, the special consideration has been given not only to idiocy but also to higher grades of feeble-mindedness. The judgment of earlier feeble-mindedness is based upon the history given by family, results of school examination and times held back in the same grades.

The nervous and psychopathic constitution offers no less significance but conspicuous cases alone are taken into consideration because of the difficulty of obtaining exact history of the patients in this particular point.

4. *Adult Life*

Important factors occurring in adults are trauma in head, acute infectious diseases and alcoholism. Delirious and fever diseases often give rise to dementia precox but these are not real causes and should be considered as precipitating factors.

5. *Status Presens*

The insufficiency of the hereditary and previous history can be supplemented oftentimes by the physical examination of the patient. The following are considered to be of import:

(a) Abnormality of the cranium:

- (1) Microcephalus.
- (2) Macrocephalus.
- (3) Asymmetry of the cranium.
- (4) Asymmetry of the face.
- (5) Brady- and Dolico-cephalus.

(6) One having conspicuous functional disturbances in nervous system makes us suspect underlying disease in the brain. Such are tottering, strabismus, nystagmus, facial paralysis, asymmetry of reflex manifestations, etc. Care should be taken as to whether or not these disturbances started after the onset of dementia precox.

MATERIAL

Material consists of patients admitted in Matsuzawa Hospital (formerly Sugamo Hospital), Tokio-fu. Since 1902 up to the present date we have had 1,700 patients, but all of these are not available for our study because of the meager description of earlier protocols. For this reason we used protocols written by ourselves in 1910 (January 1 to December 31), and obtained 388 cases, 246 male and 142 female, respectively.

RESULTS

The results are tabulated in the following tables:

TABLE I. MALE DEMENTIA PRECOX CASES.

Abbreviation: H = Hebephrenia K = Catatonic dementia precox P = Paranoid dementia precox

No.	Name	Diagnosis	Age at onset	Heredity			Symptoms previous to Onset					Age at onset	Present somatic symptoms
				Psychoses	Alcoholics	Others	Bodily development	Mental development	Diseases	Trauma in head	Others		
1	K	H	22	.....	Father	.....	Poor	Poor	Meningitis Convulsions	.....	.....	18	.....
2	S	K	40	.....	.....	.....	.....	.....	.....	.....	.....	31	.....
3	T	K	35	Father Elder brother Younger bro. Uncle	Father	.....	.....	Poor	Convulsions	.....	.....	18	Malformation of ear
4	O	K	51	.....	Father	.....	.....	.....	.....	Trauma at age 2	.....	19	Macrocephaly Circumfer. 57
5	N	K	18	.....	.....	.....	.....	.....	Influenza previous to onset	.....	.....	17	.....
6	T	K	46	Elder sister	.....	Father epileptic	.....	.....	.....	.....	Anomaly of character	18	.....
7	O	P	45	Father	.....	.....	.....	.....	.....	.....	.....	33	.....
8	N	K	23	Father	.....	.....	.....	.....	.....	.....	Influenza previous to onset	21	.....
9	H	K	30	Mother	.....	Consanguinal	.....	.....	Weak	.....	.....	29	Circumfer. 51
10	K	K	37	Father	.....	.....	.....	.....	.....	.....	.....	36	Asymmetry of face
11	S	K	46	.....	.....	Consanguinal	.....	.....	.....	Trauma at age 2	.....	30	Anomaly of ear
12	K	H	25	Father, Cousin cousins of father	Maternal grandfather	Parents syphilis Consanguinal	.....	Poor	Weak	.....	.....	21	.....
13	F	H	25	.....	.....	.....	.....	.....	.....	.....	.....	22	.....
14	O	K	32	Uncle Cousin	.....	.....	.....	.....	.....	.....	Febrile disease previous to onset	31	.....
15	N	H	32	Mother	Father	.....	.....	Poor	Weak	.....	.....	18	.....

16	M	K	18	Paternal grand- father				Convulsions at age 3			15	
17	Y	K	39	Aunt							17	
18	S	K	31	Uncle							24	
19	O	K	50	Aunt							22	Alcoholic
20	T	H	23	Uncle							17	
21	Y	K	15		Father's father			Weak	Trauma at age 4 & 8		14	
22	A	K	52		Uncle						32	
23	N	K	36		Father			Poor			19	Anomaly of fin- gers
24	W	H	51	Younger bro.							25	
25	K	K	24	Uncle							24	
26	E	H	39	Elder sister							16	Macrocephaly
27	M	K	32	Cousin							25	Anomaly of ear
28	N	K	36	Father's cousin				Hydrocephalus			24	
29	I	K	45	Paternal grand- father		Father syphilis		Convulsions			19	
30	O	K	30	Maternal grand- mother							19	
31	K	K	26	Mother							25	
32	N	K	23	Elder brother							21	Influenza previ- ous to onset
33	M	K	35					Anemic in childhood			31	
34	T	K	52					Typhoid fever			31	
35	T	H	35	Elder bro.				Convulsions			26	Anomalous character
36	M	K	23	Grandfathers				Weak			19	
37	K	K	33			Brothers tuber- culosis					23	Tuberculosis
38	I	K	21	Paternal grand- mother		Mother tb. Tb. in mater- nal ancestors		Poor			20	Tuberculosis

52	M	K	43	Paternal grand- father	Father						Alcoholic	27	Childish speech
53	H	K	34	Aunt. Cousin Elder sister								22	
54	S	P	40									32	
55	N	K	42		Father Paternal grand- father					Trauma in head at age 8 Trauma in head at age 2		22	Microcephalia
56	T	K	35		Father					Night terror		25	Cryptorchism
57	K	K	21		Paternal grand- father		Poor			Trauma at age 2		20	
58		K	31	Mother							Influenza previ- ous to onset	31	
59	H	K	25		Paternal grand- father							23	Malformation of ear
60	S	K	43		Maternal grand- father							16	
61	K	K	48	Elder sister	Father					Enuresis in childhood		43	
62	K	P	32			Mother nervous						22	
63	T	K	41	Father 2 Brothers			Poor			Trauma 1 mo. before Onset		25	
64	H	K	47	2 Younger bro.								38	
65	O	K	42	Younger sister		Father					?	16	
66	K	K	20	Paternal grand- father's brother		Apoplexia						28	Hydrocephalus circumf. 58 cm.
67	K	K	35		Father							22	Malformation of ear
68	K	K	24	Maternal grand- father						Weak	Anomalous character	36	
69	O	K	39	Elder bro.							Anomalous character	33	
70	S	K	33		?	Paternal grand- father syphilis Father syphilis					Alcoholic		

TABLE 1—Continued

No.	Name	Diagnosis	Age	Heredity			Symptoms previous to Onset					Age at onset	Present somatic symptoms
				Psychoses	Alcoholics	Others	Bodily development	Mental development	Diseases	Trauma in head	Others		
71	S	K	25									22	
72	U	H	42									28	
73	T	K	28			Difficult delivery			Convulsions Typhoid fever at age 20		Alcoholic	26	
74		K	28	Maternal grandfather's sister								24	
75	S	K	27	Paternal grandfather								21	
76	A	K	21	Mother								20	
77	N	K	31									16	Nystagmus
78	S	K	31	Aunt				Poor				23	
79	Y	H	44	Elder brother								29	
					Paternal grandfather								
					Maternal grandfather								
80	A	H	22	2 brothers of paternal grandfather								20	Scar in head
81	T	K	20		Father				Tottering			17	Circumf. of head 56 cm.
82	G	K	40	Father's nephew								30	
				Elder brother									
					Maternal grandfather								
83	W	K	23	Nephew of maternal grandfather		Premature birth			Weak Convulsions			22	
					Paternal grandfather								
84	T	P	34		Father	Parents Intermarriage						20	

85	M	K	60	Younger sister	Father	Tb. family	Poor	Weak	Delirium trem.	53	.....
86	U	K	30	.....	Paternal grand- father	.....	.....	.....	.....	25	.....
87	O	K	21	.....	Father	.....	.....	Weak	.....	18	Malformation o ear
88	T	K	25	.....	Father	.....	.....	.....	.....	23	.....
89	O	K	39	Mother	.....	Parents Consanguinal	.....	Hernia inguin- alis	.....	29	Anisocoria Indistinct artic- ulation
90	K	K	26	Aunt	Maternal grand- father	.....	.....	Weak	.....	22	Malformation of ear
91	K	K	39	.....	Father	.....	.....	.....	.....	30	.....
92	S	K	32	Aunt	.....	.....	.....	Weak Convulsions	.....	18	Strabismus
93	I	K	45	.....	Father	.....	.....	.....	.....	30	.....
94	T	K	47	Maternal grand- father	Father	Mother Tb.	.....	.....	.....	20	.....
95	T	K	22	Elder brother (Imbecile)	.....	.....	Idiot	.....	.....	20	Saddle nose Strabismus Indistinct artic- ulation
96	O	H	25	Aunt	Father Paternal grand- father	.....	Poor	Convulsions	Alcoholic	22	.....
97	H	K	48	.....	.....	.....	.....	.....	.....	41	.....
98	H	K	28	Father (degen- erate)	.....	.....	.....	.....	.....	27	.....
99	A	K	36	Elder bro. (sui- cide) 1 child (Hydrocephalus)	Father	.....	Poor	Convulsions	.....	26	.....
100	O	K	25	.....	Grand-grand- fathers Paternal grand- father	.....	.....	.....	Hemorrhage fol- lowing head trauma	17	.....

TABLE I—Continued

No.	Name	Diagnosis	Age	Heredity			Symptoms previous to Onset						Age at onset	Present somatic symptoms
				Psychoses	Alcoholics	Others	Bodily development	Mental development	Diseases	Trauma in head	Others			
101	M	H	31		Father 3 elder brothers			Poor			Trauma in head		25	
102	H	K	25		Father			Poor					25	
103	Y	K	53		Mother Aunt			Poor	Eclampsia				32	
104	M	H	41	Elder sister		Parents nervous					Trauma		23	
105	S	H	26	Cousin									24	
106	H	H	40										19	
107	H	K	23	Parents (hysteric)	Father				Myopia	Traumatic neu- rosis			17	
108	F	K	36										19	
109	I	K	41	Paternal grand- father				Poor					31	
110	S	K	32	Elder brother Grandfathers Uncle, Mother Younger bro.	Uncle			Poor	Convulsions				20	Tottering
111	Y	K	41						Convulsions				30	
112	O	H	33					Poor	Difficulty in speech				20	
113	H	K	41		Uncle Father				Cephalgia				25	
114	K	K	45	Aunt		Parents tb.			Weak		Alcoholic		27	Malformation of mandibula
115	K	H	46	Aunt									29	
116	T	K	35	Uncle									30	
117	T	K	39	Uncle									35	
118	Y	H	57		Father				Weak				34	
119	A	K	38		Father				Weak				21	

120	N	K	54	Mother	2 brothers	2 elder brothers degenerants			Weak			26
121	T	K	34	Father	Both grand-fathers				Nephritis			15
122	T	K	48	Elder brother					Cardiac disease			35
123	N	K	48	Father	Father	Premature birth		Poor	Convulsions			?
					Uncle				Cephalgia			
124	K	K	24	Uncle				Poor				21
125	A	K	28		Father			Poor				18
126	H	K	39		Father	Father and brothers tb.			Convulsions			22
127	K	K	33	Father					Weak			14
				Uncle					Pleuritis at age 12			Tuberculosis
128	O	K	33		Paternal grand-father	Mother nervous				Abnormal character		22
129	M	K	20		Father							20
130	K	K	41	Uncle (Idiot)	Father			Poor				17
131	S	K	35	Maternal grand-father. Aunt								27
132	Y	K	23	Younger brother								22
133	S	K	20	Younger brother (Hydrocephalus)	Father			Poor				16
												Body length 4 ft 6 inches
134	N	K	46							Trauma in head		27
135	I	K	42									31
136	I	K	28	Uncle					Convulsions			25
137	H	K	36	Parents	Paternal grand-father			Poor			Alcoholic	27
				Elder brother	Father							
				Younger bro.	Father							
138	O	K	30	Parents				Poor				17
												Microcephalia
139	K	K	28	Mother								Circumf. of head 50 cm.
				Elder brother								
				Younger bro.						Abnormal character		27
140	K	H	32	Parents	Parents							23
					Paternal uncles							

TABLE I—Continued

No.	Name	Diag- nosis	Age	Heredity			Symptoms previous to Onset					Age at onset	Present somatic symptoms
				Psychoses	Alc holics	Others	Bodily develop- ment	Mental develop- ment	Diseases	Trauma in head	Others		
141	O	K	47	Aunt	Father					Trauma in head		19	Macrocephalia 57 cm. in cir- cumference
142	K	P	43					Poor				?	Asymmetry of face
143	T	H	22	Aunt Elder sister	Paternal grand- father Father Father			Poor				20	
144	O	P	35						Weak			29	
145	K	K	21									18	
146	O	K	25		Grandfathers Father	Father tb.						23	
147	Y	K	25		Father							24	
148	T	K	47			Elder brothers		Poor	Convulsions			22	Malformation of ear
149	T	K	39	Aunt		Graves' disease						22	
150	K	K	47		Father						Alcoholic	35	Circumf. of head 51 cm.
151	O	K	31	Remote relative		Mother and her brothers and sis- ters tb.						29	
152	K	K	44		Father							38	
153	S	K	50	Father								40	Malformation of ear
154	H	P	38		Father Uncle Brothers						Alcoholic	35	
155	T	K	26									23	
156	N	K	25		Father							24	
157	N	K	24		Father							21	

158	N	K	25	Aunt	Father								22	
159	O	K	34	Paternal grand- father	Father						Trauma at age 6		33	
160	A	K	33	Father									26	
161	S	K	50	Mother	Father Uncle								45	
162	H	K	24										23	
163	I	K	32	Uncle	Paternal grand- father, Uncle								29	Macrocephalus Circumf. 58 cm.
164	Y	K	30	Mother Uncle	Father						Pleuritis at age 5 Nephritis at age 12		20	Asymmetry of cranium
165	K	K	29	Mother (degen- erant)									20	Macrocephalus Circumf. of head 58.5 cm.
166	T	K	33	Aunt Cousins	Father								17	Circumf. of head 57 cm.
167	K	K	34	Uncle	Father							Trauma in head at age 8	29	
168	N	K	29			4 brothers tb.							22	Tuberculosis
169	N	K	20										?	Circumf. of head 57 cm.
170	A	K	22										20	Macrocephalus (Malformation of ear)
171	I	K	19										17	
172	U	K	29									Anomalous character	29	
173	K	K	37	Father								Trauma in head at age 11	19	
174	T	H	21			2 sisters died immediately af- ter birth						Trauma in head at age 12	21	Asymmetry of head Circumf. of head 57 cm.
												Trauma in head at age 8		

(To be continued)

A NEW ETIOLOGICAL FACTOR IN THE PRODUCTION OF SOME CASES OF HYDROCEPHALUS *

REPORT OF A CASE

BY A. S. MACLAIRE, M.D.

NEW YORK

In discussing the subject of hydrocephalus one immediately encounters difficulties in respect to terminology. Almost every writer upon this condition has suggested either his own original classification or a modification of some one else's. It is not my intention or purpose to bore you with the proposal of a new classification or the improvement upon any of the existing ones, but I merely wish to offer for your approval what appears to me to be conclusive evidence of another etiological factor, hitherto unmentioned in the literature, in the causation of some cases of either complete internal or of the communicating type of hydrocephalus.

Let us digress here for a short period to hastily review the existing classifications in vogue at present. Elsberg,¹ Dandy and Blackfan² apparently the same clinical pictures. Elsberg¹ divides hydrocephalus into an obstructive and non-obstructive form. The latter group is subdivided into (1) a hypersecretive type wherein the stasis of the cerebrospinal fluid and the resulting ventricular dilatation is the outcome of an increased production of cerebrospinal fluid in the ventricles, mainly in the laterals, third and slightly in the fourth, over the normal absorptive coefficient; (2) a diminished absorptive form where the amount of cerebrospinal fluid manufacture is normal but the absorptive power of the subarachnoid spaces, Pacchionian bodies and sinuses is markedly lessened and (3) a combination of both types 1 and 2.

Dandy and Blackfan² classify their cases as obstructive and communicating. To fall into the obstructive group, a complete occlusion anywhere along the ventricular system as far as the foramina of Magendie and Luschka is absolutely essential. The cerebrospinal fluid must not be capable of entering into the cisterna magna. On the other hand, in the communicating type, the ventricular circulation

* Received for publication March 19, 1925.

¹ Elsberg, C. A. Interstate Med. Jour., Vol. XXIV, No. 12, 1917.

fan,² Frazier³ and Sharpe⁴ employ different nomenclatures for

² Dandy, W. E., and Blackfan, K. D. Amer. J. Dis. Child., 1914, VIII, 406; 1917, XIV, 424.

is primarily intact but the obstruction occurs in one of the basilar cisterns or in the subarachnoid spaces. An obstruction in any of the large cisternal reservoirs would produce a stasis and secondarily a dilatation of the ventricles.

Frazier³ speaks of hydrocephalus obstructivus, nonabsorptus, hypersecretivus and occultus. The first three are the same as in the classification of Elsberg but the last one requires a little explanation. In the latter group the size of the head remains in the main unenlarged, *i.e.*, the size of the head is normal, but an excess of cerebrospinal fluid is found in the ventricles, basal cistern and sometimes throughout the entire subarachnoid spaces. Another singular feature of this type is the fact that it may occur in adults. Symptomatically, this group closely approximates the brain tumors but the fact that the pathological condition is one wholly of fluid distribution, Frazier feels that they should be included in the hydrocephalus class.

Sharpe⁴ adheres to the original nomenclature, namely that of internal and external hydrocephalus, together with a form which he designates as combined, which is a combination of both forms and corresponds to the communicating type of Dandy and Blackfan.

It is readily observed that all the above mentioned authors agree to the type of complete ventricular occlusion as being obstructive or internal hydrocephalus. Again, all agree to a form where the pathology lies not in the ventricular system proper but outside of it. Various terms, as cited above, are employed for this division. Thirdly, all coincide in the belief of a certain group whereby a combination of both forms exists. Thus, to summarize, the three types of hydrocephalus, strictly speaking, depend upon the amount of pathology and the location of its presence.

Etiology. Up to the time of the exhaustive works of Dandy and Blackfan,² it was considered and taught that hydrocephalus was congenital without a definite etiological factor being offered. (The cases following epidemic cerebrospinal meningitis in older children are not included in this discussion.) These workers deserve great praise for their painstaking and thorough study of this subject. It was the first work of advance accomplished in this field. The final conclusions of their work was the accepted and proven theory of prenatal cerebrospinal meningitis in utero as a predominating cause of hydrocephalus. With the acceptance of their findings, the older, unqualified, congenital cause, aside from the embryological malformations, was discarded entirely by most workers in this field.

³ Frazier, C. H. *Am. J. Dis. Child.*, Feb., 1916, Vol. XI, pp. 95-102.

⁴ Sharpe, Wm. Personal communication.

To this scant list of causes, I wish to add another factor as an etiology in the production of some cases of hydrocephalus. That hydrocephalus may also be produced by the resultant effect of an intracranial hemorrhage at birth in those cases that had either sufficient vitality to overcome the initial and immediate effects of the hemorrhage or the ability and power to absorb the hemorrhage never occurred to me as a possibility until I actually observed such a case in consultation not only at the time of birth but also when the hydrocephalus developed clinically eight weeks later.

In the extensive work performed by Sharpe and myself⁵ on intracranial hemorrhage of the newborn, it was demonstrated that intracranial hemorrhage as a birth trauma occurred more frequently than hitherto suspected. In our series of routine lumbar punctures on 500 almost consecutive newborn babies, 45 or 9 per cent evinced conclusively the presence of an intracranial hemorrhage of varying degree. In several of the severer cases that died, where an autopsy was secured, the presence of an intracranial hemorrhage was confirmed and in that manner substantiated the value attributed to lumbar puncture as a diagnostic method. Not one post-mortem performed failed to sustain the pre-mortem diagnosis of intracranial hemorrhage where the lumbar puncture was positive for blood and, vice versa, no autopsy performed on any case in the absence of bloody cerebrospinal fluid as obtained at lumbar puncture revealed an unsuspected and undiagnosed intracranial hemorrhage. Although an effort was made to secure a post-mortem examination in every case that died, yet our efforts were not always crowned with success; but in those cases where an autopsy was permitted the positive lumbar puncture findings in this series were always confirmed.

The case to be presently described appeared to me to possess fairly conclusive or at least, very markedly suspicious, circumstantial evidence of a new etiological factor in the production of hydrocephalus to warrant the publication of my view as a new discovery.

Report of the Case. On November 12, 1924, I was called to see the following case at Lippincott's sanitarium. The newborn baby J. was delivered at 6:55 A.M. that same day. The Gwathmey method of narcosis had been employed; the labor was a breech but was not very difficult except that the obstetrician noted that the head was not as easily delivered as ordinarily. The child had to be resuscitated. At 8 A.M. the baby vomited blood for the first time and from then on until 1 P.M. when I first saw her she had vomited

⁵ Sharpe, Wm., and Maclaire, A. S. J. A. M. A., LXXXI, Aug. 25, 1923, pp. 620-624; Surg., Gyn. and Obst., Feb., 1924, pp. 200-206; Amer. J. Obst. and Gyn., Vol. VIII, No. 2, Aug., 1924; Amer. J. Obst. and Gyn., April, 1925; Jour. Obst. and Gyn., Brit. Emp., April, 1925; Surg., Gyn. and Obst., to be published.

small quantities of blood. No melena was noted; the meconium was normal. The birth weight was recorded as 6 lbs. 4 ozs.

At 1 P.M. the examination revealed the following positive signs: the color was poor in that it was pasty and yellow, occasional crying was heard but the child was chiefly drowsy. Hot water bottles served to maintain the body temperature as the removal of them produced rapidly a cooling of the body surface. Twitchings of the left orbital muscles occurred intermittently, the intervals being far apart, though each attack lasts a few seconds. In addition, a tonic spasm of the left hand was present. Marked nystagmoid twitches were noted mostly on looking upward, although some were present on looking to the sides and downward. The right palpebral fissure was smaller than the left. The anterior fontanelle was tense but flush. Skew deviation of the eye upward was present on the left side. The temperature was 103.6° F. A lumbar puncture revealed thick, bloody cerebrospinal fluid; the blood percentage of that particular specimen obtained ranged between 60 and 75 per cent; the intradural pressure registered 16 mm. Hg. with a mercurial spinal manometer. About 4 c.c. of the above described fluid were removed at this puncture and it remained in fluid form until 6 P.M. (five hours later) when it was discarded. The diagnosis was a severe intracranial hemorrhage and the prognosis given at that time as to the recovery of life was grave and problematical. Personally I felt that the child would not survive the rest of the afternoon. When I returned that evening I was surprised to find the child still living. The following notes were made at the second examination: the child appeared brighter and better although she was at times still drowsy. She breathed with more ease. Blood had been vomited again one-half hour before my arrival. A second lumbar puncture revealed the same character bloody spinal fluid as removed earlier in the day; 3 c.c. of fluid were withdrawn this time. The nurses reported that after the first lumbar puncture the twitchings about the orbital muscles had ceased. The child was placed on a formula of Dryco and water. On the next day the occurrence of twitches of both orbital muscles were reported again; the temperature was 104.6° F. Jaundice had made its appearance. To what this icterus was due is difficult to state specifically or definitely. Whether it was biliary or hematogenous in origin is also to remain unsettled for the present. It is highly probable, however, that the icteroid coloring was the result of the partial absorption of the intracranial hemorrhage. The cry was still weak but stronger than the previous day. The condition was charted as improved although still not favorable. A hematoma had formed at the site of the spinal puncture which prevented the successful entrance of the vertebral canal in spite of several attempts. I attributed the presence of the hematoma to the constant, slow seepage of bloody spinal fluid through the puncture opening in the dura. Ecchymosis of the left foot and toes were present. The left fingers were still retained in the flexed position and the child was drowsy. On the next day the spinal canal was successfully entered and 3 c.c. more of the same consistency bloody cerebrospinal fluid were drained. The temperature had dropped to 99.4° F. On the following day the child had improved remarkably, at least clinically; the cry had become healthy in character and the normal demand for food was present. The temperature registered 98.4° F. Although it was felt that the intracranial hemorrhage had not been successfully treated, yet in view of the wonderful clinical recovery, it was decided to discontinue

further spinal drainage. Cranial drainage was considered but was not advised in view of the clinical improvement.

At the age of one month the child was considered to be developing normally. I was called again to see the child when she attained eight weeks of age. The pediatrician in whose care she was placed felt that all was not well at this time. On examination, the anterior fontanelle was found in communication with the posterior fontanelle through the open sagittal suture; the coronal sutures were beginning to open. The fontanelles were large and tense. The fundus examination, although not entirely satisfactory, gave the impression that the discs were distinctly pale. No other pathological signs were detected at this time. The reflexes were normal. The lumbar puncture revealed clear spinal fluid under a pressure of 20 mm. Hg. as registered by the spinal mercurial manometer; the fluid escaped freely. Upon the removal of a few c.c. the anterior fontanelle began to pulsate and became depressed by the next day. This change was only temporary as might have been expected. The diagnosis at this consultation was hydrocephalus of the communicating type. Ventricular puncture with the routine dye tests were advised, also a ventriculography, but both suggestions were not accepted. Up to date no further studies have been made.

Comment. In view of the fact that a hydrocephalus was present at the second examination eight weeks after birth together with the absence of any such evidence at birth and an etiological factor, possible of producing adhesions, was present at the time of birth (hemorrhage), it is logical to conclude that the incomplete absorption of the hemorrhage produced the organization residue and the deposit of this new formed tissue over the cortex and along the base of the brain caused the development of the hydrocephalic condition in the course of eight weeks. It may be asked whether this case was not hydrocephalic from the outset, a prenatal meningitic condition? It is possible for the two conditions to have existed concomitantly at birth but it appears to me that the hydrocephalic condition would have been discovered at one month of age, the time the child was considered normal, as the interference with the cerebrospinal fluid circulation would have been in progress some time in utero and would have manifested itself sooner. If we concede the hemorrhage to be the cause, we can readily explain the lapse of time before the hydrocephalic condition became sufficiently obvious to make a diagnosis. The mechanism can be interpreted as follows: after the hemorrhagic clot was partially absorbed but mostly organized, the normal channels of excretion for the cerebrospinal fluid were occluded to a large degree. This continued until the back pressure became sufficiently great to distend the ventricles and the bulging brain secondarily forced the individual cranial bones to separate and thus to widen the sutures. Besides when one etiological factor presents itself as the possible explanation for a certain condition, why should we complicate the situation by seeking a cause elsewhere? Why

should we not accept a single, plausible and probable cause as the answer for a particular condition in any individual instead of searching for several causes as the explanation for that same condition?

We know that intracranial hemorrhage was present at birth. We are cognizant of the development of hydrocephalus eight weeks later. We are aware of the fact that organized hemorrhage will produce adhesions. Thus, if we have the substance present (adhesions) that will cause the condition (hydrocephalus), then it is logical to conclude that in this particular instance the cause and the result are correct. Therefore, it seems proper to assume that the adhesions in this case produced as a result of the organized intracranial hemorrhage was the true etiological factor in the production of the hydrocephalus.

Treatment. The treatment of hydrocephalus at present is uniformly bad at the very best. The treatment in this particular type of hydrocephalus, where hemorrhage is the cause, is at the time of birth when the blood is still in fluid form. This method of spinal drainage was attempted in this case, but was not successfully accomplished. This instance is an example of improper treatment, but we are only at the beginning of this kind of therapy and I hope that the future will be brighter in granting us better results.

If spinal drainage is insufficient in its results as can be determined within a few days, then we must resort to the routine cranial measures for draining the hemorrhage. The present methods for treating hydrocephalus have been unsatisfactory regardless of what measures have been taken or whose method has been employed. All the attempts at drainage in hydrocephalus, regardless of the route, have been futile in their end results.

Corpus callosal punctures have not lived up to the expectations desired. Subtemporal decompression with ventricular drainage by means of linen strands have also failed in their purpose. Drainage into the thorax has not met with success.

CONCLUSION

In closing, I merely wish to reiterate that in this one case where I have had the opportunity to observe the patient at birth possess one condition (intracranial hemorrhage) and then to develop another condition, wherein the end result of the first condition could act as the etiological factor in the second condition, I feel quite confident that the initial condition produced the second one. Thus, I believe that intracranial hemorrhage in the newborn is another cause in the production of some cases of hydrocephalus.

1157 Lexington Ave.

SOCIETY PROCEEDINGS

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY

REGULAR MONTHLY MEETING, APRIL 16, 1925, WILLIAM
HEALY, M.D., PRESIDENT, IN THE CHAIR.

SARCOMATOSIS OF THE BRAIN

DR. B. M. FRIED

A man, thirty-three years old, was admitted to Dr. Cushing's Clinic at the Peter Bent Brigham Hospital with a history of headaches, staggering gait and attacks of unconsciousness which began suddenly about ten weeks previous to his entry. Two or three weeks later he developed aphasia, anosmia, ataxia of left arm and hand, and increasing somnolence. Examination revealed a choking of the left disc of 5 diopters and contraction of field of same eye, a left facial paresis and increased deep reflexes. (The right eye was blind, due apparently to a head injury two years previous to present illness.) There was a coarse nystagmus to right and left, a marked ataxia of the arms and of both legs. The patient was unable to stand with his heels together, tending to fall backward and to the right, and was totally unable to walk without falling backward. He was disoriented to time and place; his speech was slow and hesitant, and the comprehension very poor. The blood and urine examinations were negative. The Roentgen-ray examination showed no pathology. The patient died after a few days stay in the hospital.

The necropsy, limited to head, revealed in gross one tumor nodule 1 by 0.5 cm. in the first temporal convolution of the left side. A microscopic examination of different parts of the brain revealed tumor cells scattered singly and in nests in the cerebrum, cerebellum, pons and medulla oblongata. The cells were small (4-5 mikrons in diameter), regular in outline, polygonal or roughly cuboidal and provided with a narrow cytoplasm and round nucleus and nucleolus. There were numerous mitotic figures. The growth had a purposeless arrangement, was moderately vascular and provided with a very scant fibrillary stroma. Tumor cells were found in the adventitia of the larger veins and precapillaries in which the limitance glia and intima pia, as well as the endothelial lining were intact, and also surrounding the vessels in the His' spaces. Two possibilities were discussed: (1) the growth being a metastasis (since the necropsy was limited to head only, such an occurrence could not be disregarded); (2) the growth being primary in the brain.

In the case of a metastasis the tumor could be morphologically regarded only as a lymphoblastoma. It is, however, unique: in regard to (1) the localization of the secondary tumor (cerebrum, cerebellum,

pons, medulla and leptomeninges), and to the diffuse infiltration of these structures; (2) to the sudden onset of the disease with brain symptoms simulating an unlocalized tumor, or encephalitis; (3) to the absence of any signs or symptoms referable to other organs during the duration of the disease; (4) in addition to a marked edema of the brain to grave secondary changes produced by the tumor in the cerebral parenchyma.

As regards the new growth being primary in the brain, a differential diagnosis was made between tumors of glial, nervous, ependymal or glandular (pineal) origin, and also between endo and perithelioma. The endothelium in this case, except for swelling, did not show any proliferative or hyperplastic changes. Perithelial tumors are usually characterized as being composed of epithelioid cells surrounding the vessels in a sleeve-like manner, suggesting an etiological relationship between the "perithelium" and the tumor cells. The growth could not be identified, neither morphologically nor tinctorially as an ependymoma or pinealoma.

As regards a spongioblastoma (or neuroblastoma of some writers), the cells stained with Mallory's, Hortega's or Bielschowsky's stains did not show any characteristics typical of the embryonic spongioblasts. The arrangement of the cells was purposeless, and so-called rosettes, noted by some pathologists, as being a feature of neuroblastomas, was lacking entirely. Cajal's silver nitrate method failed to disclose neurofibrillæ which are present in neuroblastomas. Again, the spongioblastoma infiltrates usually the surrounding tissue for only a short distance, whereas in this case the tumor invasion was inconspicuous and diffuse throughout the entire brain. Finally the presence of tumor cells in the wall of the vessels have never been observed in tumor of glial or nervous origin.

A careful examination of the vessels and their relationship to the tumor cells, showing the presence of the latter in the vascular adventitia, and also of mitotic figures in the adventitial cells themselves, suggest strongly that the tumor originated from the adventitial cells of the Virchow-Robin spaces, and ought to be regarded as a so-called "Round cell Sarcoma," or what has been described as "Diffuse Sarcomatosis of the Brain and Leptomeninges." (Schlesinger, Schlagenhauser, Nonne, Rindfleisch, Westphal and others.)

The occurrence of the tumor is extremely rare. This is the single case in Dr. Cushing's series of over one thousand of verified brain tumors. The great majority of tumors previously reported as diffuse sarcomatosis of leptomeninges (particularly in children), (Olivier, Schultze, Hadders, Couplan-Pasteur [2nd case], Rush, Rach, Firor and Ford and others), on close examination seem to impress as being rather new growths of glial origin, namely, spongioblastomas. Unfortunately in a number of previously reported cases of "Sarcomatosis" the diagnosis was made only on the clinical picture or on the gross appearance of the growth alone.

The remarkable in tumor was also the secondary changes in the cerebral parenchyma which showed a heavy, fatty infiltration, edema and degeneration of ganglion cells, glia cells and nerve fibers. Not

infrequently ganglion cells were invaded or surrounded by tumor cells. As a rule they showed fatty degeneration, disorder in the Nissl's substance, which was gathered in clumps or pushed to the periphery. Changes were also conspicuous in the nucleus and nucleolus, but to a minor degree. There were neuronophagia and satellitosis. Ameboid and monster glia were more marked around the tumor nodule but were also seen elsewhere. The nerve fibers showed fenestration, tortuosity and thickening. The myelin sheaths were mostly lacking entirely.

The changes in the brain are apparently due to two factors: (1) Mechanical. The tumor cells grew frequently around the vessels surrounding them in a sleeve-like manner and also in the vascular adventitia itself thus blocking the circulation followed by stasis and edema of the brain. (2) Toxic: "toxicity" characteristic of malignancy in general is obviously characteristic of sarcoma of the brain.

The interest of this case is therefore (1) in its histogenesis (from the adventitial cells of the Virchow-Robin spaces); (2) in the *inconspicuous* and diffuse infiltration by tumor of all parts of the cerebrum, cerebellum, pons and medulla; (3) in the secondary grave changes produced by the tumor in the cerebral parenchyma; (4) in the sudden onset of symptoms, which indicated a brain tumor with an indefinite localization or some kind of encephalitis.

Discussion: Dr. Percival Bailey: The tumor which Dr. Fried has reported has been exceedingly interesting to me because of the doubt which exists concerning the possibility of having a primary sarcoma of the brain. Fifty years ago the diagnosis of sarcoma of the brain was made frequently, but gradually the opinion became generally stable that these so-called sarcomata were in reality gliomata consisting of very embryonic cells. If a true sarcoma, that is to say a rapidly growing tumor of connective tissue origin, occurs primarily in the brain, it must arise from the cerebral blood vessels. Dr. Fried, so far as I know, has for the first time proven definitely that such a tumor may arise from the cerebral blood vessels. He has pointed out very clearly the characteristics which separate this tumor from metastatic sarcomata which are sometimes seen in the brain. Only by accident was a nodule of tumor discovered and it is doubtless because of the early stage of its development that Dr. Fried was able to prove its origin from the cerebral blood vessels. Had it increased considerably in size, such a demonstration would not have been possible.

Dr. E. W. Taylor: As I understand from the description Dr. Fried gave, there were many signs of increased intracranial pressure, and it is rather difficult to see why such an infiltrated tumor should produce increased pressure. Was there any dilation of ventricles?

Dr. Fried: I think the ventricles were dilated. The brain was practically destroyed and gave signs of intracranial pressure.

REPORT ON THE ONE HUNDRED CASES OF THE
PSYCHONEUROSES

DR. L. K. LUNT

One or more of five factors generally considered as causing the psychoneuroses—physical illnesses (past or present), the endocrines, environmental conditions, hereditary taint, and the individuality of the patient himself. Probably all may play some part. In Riggs' series of eight hundred cases of the psychoneuroses only 31 per cent; and in this series of one hundred 38 per cent showed an unusual amount of illness in the past history. The present physical condition was in general good, only 16 per cent of the one hundred showing any significant physical findings. One had hyperthyroidism, the only one showing definite endocrine disturbance. There is no conclusive evidence that these glands of internal secretion are responsible for the neuroses. Of the environmental factors middle age and old age are partially "intrinsic" and partially "extrinsic." "Intrinsic" because of the physiological changes incident to age and "extrinsic" because of the not infrequent difficulties outside of the individual in adapting to advanced years. Eighteen and one-half per cent of fifty-four persons between thirty and fifty years and 70 per cent of the twenty over fifty years showed age as being a definite factor in their maladaptation. Difficulty in adapting to some member within the family group appeared in thirty-eight cases. Considering occupation as an environmental factor we find only one where real occupational difficulty appeared and eleven who had no definite occupation. Presence of nervous diseases and disorders as well as physical diseases in the ancestors did not seem to occur in any greater proportion than would probably occur in the history of a similar number of general medical and surgical cases. Heredity is not considered as being more than one factor which helps to make up the "neurotic" risk. The principal factor seems to lie in the individuality—namely, the degree of sensitiveness, the balance of instincts and failure to use the intelligence on the situation. Eighty-four possessed more than usual sensitiveness thus causing an excess of instinctive response which brought about maladaptation when the intelligence was not adequately used. At least ninety had an intelligence adequate to meet their situations. Therefore rational psychotherapy is distinctly indicated and yields very satisfactory results.

Discussion: Dr. G. A. Waterman: One may divide people into groups according to their color, race, education, religion, or any other given basis. In a like way one can divide the causes of breaks in the psychoneurotic according to maladaptation to life, shocks, fear of death, psychic trauma, etc. There are certain people who have a fear of old age; others who are unable to meet adversity or disaster; others who cannot cope with the social problems of life. There are in all instances two basic factors which are fundamental in all cases: First, heredity, which determines the material with which a person starts life; second, the early training and environment which sur-

rounds the patient during his early years. The over-protection and over-mothering of the only child poorly equips him to meet disappointments of later life, or the crushing domination of either parent develops the inferiority feeling and the child attempts to escape responsibility and finds refuge in various defense reactions. These things, together with the memories of early fears which remain in the subconscious often crystallize themselves in the various symptoms which manifest themselves in later life.

Dr. E. B. Lane: I have observed in several of my cases what I called an injury to the ego, an injury to pride. A person was demoted, and it has brought about some very curious things. He is afraid he is going to injure his children; he is afraid he is going to assault his wife; he is afraid of this, and he is afraid of that. The starting point seemed to be that he had held a place of which he was very proud. The firm with which he was connected was dissolved, and he had to have, what was to him, an humbler place and go about the streets doing things that he had looked down upon other people doing. That has so upset him that it has practically destroyed his usefulness for a while. I remember another case where a man, in very good financial circumstances, failed in business. The newspapers made a great deal of his failure. His partners took their money out and concealed it. He took all the losses and much unpleasant notoriety. He was depressed and suicidal. Two years later he showed himself master of a bad situation. He had three trained nurses to care for three members of his family who were ill, but he was perfectly game through it all. His own ego had not been touched. It is well to look for that sort of thing. Curious reactions come as impulses as a result of these wounds. I was rather surprised at Dr. Lunt's figures, but I have seen many more of the fear than he has. Take an extremely jealous person. I think many of these jealousies are really fear, fear that they have lost their place in the community, that somebody else is going to get what belongs to them. That is a very painful emotion. They lose their self-control. Dr. Lunt is studying each individual and trying to keep away from too many classifications, taking each case independently as is proper.

Dr. C. Macfie Campbell. Dr. Lunt has presented the subject of the treatment of the psychoneuroses in a sober and well balanced manner. In the absence of concrete cases any discussion must be general. One might refer to the stress which Dr. Lunt has laid upon the rôle of intelligence. The appeal to the intelligence of the patient is made the keystone of the treatment. The rôle played by the personality of the physician and the emotional factors involved in the relationship are not emphasized. The dynamic elements involved in the relationship of one human being to another are among the most primitive and deep-rooted forces in human nature. In this relationship the intelligence plays a small factor. Though the physician may be reviewing in a rational way the life situation and past experiences of the patient it is not necessarily the rational factor, it may be the emotional factor which is the vehicle of the therapeutic influence. In following the physician in his rational exposition the patient is

not only subject to certain emotional forces, but is also making a very definite effort, and it is this dynamic effort under the personal influence of the physician, which does so much good to the patient and is perhaps the most important measure of the success of the treatment. The physician encourages the patient to face the situation squarely and the latter in doing so is engaged in no mere intellectual exercise. The patient is encouraged by the personal influence of the physician, as well as by his rational formulation, to put forth his latent forces which are limited by heredity, by somatic conditions, by residuals from early experiences.

Dr. D. Gregg: How early can you determine dominant and recessive types? There was a classmate of mine who was one of the most pugnacious men we ever had. He was a very shy individual who was unable to get on his feet and talk until he had gotten himself mad. Then he could talk pretty well, but he was always talking in a pugnacious strain. I should think there might be some confusion arising in that way.

Dr. W. Healy: Dr. Lane spoke of demotion being a cause of psychoneuroses. But then Barrett at Ann Arbor tells of cases of men who suffered from considerable psychoneuroses and mental breakdowns as a result of being promoted, of having their salaries increased. They could not stand the situation, and they really did very much better when they were released from their increased obligations and sent back to a lower level of work and a smaller salary. I should like to have Dr. Lunt tell us what the extrinsic or intrinsic factors have to do with prognosis.

Dr. Lunt: I gathered from Dr. Waterman, although it may have been incorrect, that his feeling is that the psychoneurotic is inadequate. I do not know if he intended to imply that or whether it was an implication of mine, but certainly it is a fairly popular opinion. For my part, I do not like to consider a psychoneurotic an inadequate individual. With our experience we find the majority of psychoneurotics essentially adequate, that the presence of a psychoneurosis is not necessarily evidence of an inadequacy. In regard to subconscious memories playing a part in psychoneurotic breaks, there does not seem to be much question that in a certain number of cases that is so, but I believe that in the majority of the psychoneuroses the past memories have become harmless and relatively unimportant except, perhaps, in some cases of the compulsive type of neurosis. Dr. Lane spoke of a man who had been demoted, and I cannot help but wonder if he is not one who left Stockbridge a short while ago unimproved, and whom we regarded as being very close to a psychotic individual. Dr. Healy mentioned promotion as a cause of a psychoneurotic break. I do not know the exact figure, but unquestionably we see a definite number each year of men who have been promoted above their ability, and the result has been a breakdown. I remember one man who had been in a bank some twenty-five or thirty years and had proved to be a very reliable person. He was "in the cage," worked hard, and got good pay. His promotion took him out of the "cage" and gave him a desk where he had to meet people, sign

checks for thousands of dollars every day, and he broke down. We tried to keep him on the new job, as we thought he could live more sensibly, have better hours and better pay, but he broke down again. So his employers put him back in the "cage," and a year later he was very happily at his former pursuit. Perhaps Dr. Lane misunderstood me regarding the aggressive type predominating. In this classification I put 60 as recessive and 40 as aggressive; in other words, the recessive seemed to predominate. Dr. Campbell emphasized the personality of the operator. I am glad this has come up because it opens up the question of suggestion. No doubt suggestion plays a very large part in all branches of medicine and the personality of the doctor is absolutely bound to come in. If there is a reasonable congeniality between the doctor and the patient the result is more apt to be favorable than if there is not, leaving out other considerations. But it seems to me we must bring in another element, namely, intelligence. We must try to give the patient a new point of view in which he will use this element which he has not before used on the situation. In Dr. Riggs' series of 800 cases, 82 per cent were on the job satisfactorily on final reports which averaged two years after discharge. It seems to me the personality of the physician, plus his ability to get his suggestion accepted, although they may have helped considerably in giving the patient the start, were not the whole factor; something else was brought into the situation, namely, what we are pleased to call the patient's intelligence. I am not sure that I made sufficiently clear the use of the terms "extrinsic" and "intrinsic." "Intrinsic" applies to factors inside the body; "extrinsic," those factors which bombard the nervous system from outside the body. No doubt there is too much disregard of the physical, and it is a great mistake; physical examinations must be carefully done and all symptoms evaluated with the physical possibilities in mind. Dr. Gregg asks how clearly we can differentiate between aggressive and recessive types. It is difficult to so differentiate really satisfactorily in some individuals, and I had some difficulty in a number of these cases in arriving at an acceptable classification. The case he mentioned sounds as if the man had an essentially recessive type of personality and that his pugnacity was compensatory. In answer to Dr. Healy's question, I should say that it did not make very much difference as to the prognosis whether the difficulty was extrinsic or intrinsic. I think, as a rule, where there are any intrinsic difficulties there are practically always some extrinsic difficulties as well, that the intrinsic are usually a part of the emotional reaction to some extrinsic difficulty.

CURRENT LITERATURE

I. VEGETATIVE NEUROLOGY.

1. VEGETATIVE NERVOUS SYSTEM.

Mayo, William J. COÖRDINATION OF HUMAN VEGETATIVE FUNCTIONS.
[Surgery, Gyn., & Obstetrics, March, 1924.]

The era of surgery based on gross pathology is passing. Investigations of a physiologic nature are enabling the detection of pathologic changes in tissues in the early transitional periods; this fact leads to the hope that many diseases can be recognized at such an early stage of deviation from the normal that they may be prevented from assuming serious aspects. Because of this hope, the work of the physiologist and psychologist is being followed with the greatest interest by the surgeon, and deductions are being made which affect the whole surgical concept. Cathcart and Benedict estimate that only 25 per cent of the energy produced in the body can be expended by the muscles under the control of the will, 75 per cent being used by the vegetative functions of the body, of which we are unconscious. In order to obtain a general view of the subject I have reviewed briefly, as related to those functions of which we are conscious (25 per cent), some facts and near facts which underlie the mechanism of coördination and control of the vegetative functions (75 per cent). "He that does not go beyond the facts," said Huxley, "will seldom get as far as the facts."

Nonstriated muscle is one of the most interesting and important tissues of the body, not only because it is the tissue earliest concerned in motion, but because it has been endowed with a curious type of self-control possessed by few, perhaps by no other, tissues in the body. Nonstriated muscle originates its own action, and within the limits of the influences which necessitate the action, it is self-sufficient. The production of power to carry on the vegetative functions lies in the nonstriated muscular system, and the ultimate source of this power is molecular and colloidal energy released through enzyme action which is as marvelous as the energy in radium.

It has been believed that the capillaries were endothelial channels, but Krogh has confirmed the observation that even the finest capillaries contain smooth muscle fibers through the walls of which oxygen and crystalloids, such as glucose sugar and the amino acids, supply the body cells by diffusion. Crystalloids are in a molecular state and penetrate the capillary walls everywhere, because the pressure inside the arterial capillary is greater than that in the tissue space, and greater in the

tissue spaces than in the venous capillary which receives the waste products of oxidation, but unless there is great dilatation of the capillaries which increases their permeability to larger bodies the colloids normally do not penetrate the capillary walls, except in the liver and gastrointestinal tract. The colloids of the blood are made up of different sized molecules; hence, there is variation in the permeability of the capillary wall to different colloids. Hyperplasia, as well as hypertrophy, is an extraordinary attribute of the nonstriated muscle, and in conjunction with its autocontrolled rhythmic action is responsible for the production of power in the work of fundamental functions. In this power of rapid growth lies the cause of the leiomyomas of which the so-called uterine fibroids are the most common.

The manner in which this is accomplished is shown by Keith, who discovered the nodal system and more or less accurately located eight neuromuscular nodes which can be compared with the sinoauricular nodes of the heart, and may be said to act on the intestinal tract as pace makers like the block system on a railway. The illuminating character of embryology in its illustration of clinical problems is found in the frequency of ulcer of the first portion of the duodenum and forces on us the realization that fundamentally the first portion of the duodenum, while it has the form of the intestine, biologically is part of the stomach, having its origin in the primitive foregut and receiving its blood supply from the celiac axis.

While we recognize the autocontrol of the nonstriated muscle and believe that the stimulation which results in intestinal peristalsis, for example, is largely mechanical, this power of originating muscular actions is closely related to and influenced greatly by another form or more generalized coördination which is best understood under the general title of internal secretions. Starling asserts that the internal secretions antedate all forms of nervous systems. It is interesting to note that the alliance between the sympathetic nervous system and the glands of internal secretion is relatively close.

No study of the coördinating power of the nonstriated muscle and the internal secretions would be complete without an understanding of the sympathetic nervous system as represented by the great sympathetic ganglions of the thorax and the abdomen. We are indebted to Gaskell for the most illuminating researches in this field. He pointed out that certain small-calibered, medullated nerves pass from the anterior horns of the spinal cord to the great sympathetic ganglions and that this communication is direct from the cord to the ganglions. From the great sympathetic ganglions small, nonmedullated nerves pass to all parts of the body, usually along the blood vessels, to control the production of instantaneous and widespread actions. The skeletal muscles simultaneously are made ready for action under the control of the central nervous system. When the necessity for these defense manifestations has passed, the

parasympathetic nerves described by Gaskell and Langley restore the normal condition. The most important of these parasympathetic nerves are the vagus, a small calibered, medullated, cranial nerve, which reduces action of the heart and respiration and sets in motion the gastrointestinal tract, and the pelvic nerve, which permits emptying of the bladder and rectum that have been temporarily in abeyance. The parasympathetic nerves are peculiar in that they have ganglion and nodal cells at their termination, for instance in the nonstriated muscle of the intestinal wall, as Auerbach's and Meissner's plexuses.

We can safely say that the vegetative functions, being older in point of heredity, are more stable and better organized than the more recently acquired central nervous system which is subjected to the many emotional influences which may affect unduly the autonomic control and coördination of the vegetative functions. In the unstable individual these functional disturbances may be so exaggerated as to more or less resemble pathologic processes which are accepted by the patient and the unenlightened as true, although known by the trained observer to be false. We recognize that thought is the product of a material substance, the brain, but because we cannot see the thought we treat it as nonexistent. Bodily fatigue is the result of the inability of the exhausted tissues to burn glucose sugar with sufficient rapidity and to rid themselves of the products of combustion. Rest restores the oxygen balance, and food furnishes the carbonates which prevent exhaustion acidosis. Fatigue of the emotions, so-called neurasthenia, concerns mentality and we know very little about it. Peabody says that neurasthenia is, to a great extent, a disease of the idle rich. We may well say that contented industry is the well-spring of human happiness. The economic status of the patient is not so directly concerned with the more common types of the so-called neuroses which are fixed tissue delusions on the general principle of, "If you believe it, it is true." These unfortunate conditions are true to the patient whether or not they are to the diagnostician.

The special office of the central nervous system is to bring the bodily component parts into harmonious mechanism which will react as a unit to the world around us. The query arises: Are not many, perhaps most, of these unstable nervous conditions, so-called neuroses, which are exploited by the cults and quackeries, the results of an attempt of the newer part of the central nervous system to take control of previously established coördinating functions, unrighteous attempts at control of the sympathetic ganglions, the internal secretions, and the primitive nonstriated muscle by an unbalanced recent development of the forebrain? [Author's abstract.]

Abadie, C. ATROPIN IN SPASTIC CONDITIONS. [Presse Médicale, April 19, 1924.]

Abadie refers, among other instances, to a case reported by Bard in which disturbance of vision and local asphyxia of the extremities had

preceded and accompanied angina pectoris. All these phenomena are due to spasms of blood vessels. Abadie advises, in order to recognize if atrophy of the optic nerve is caused by a shutting off of the blood supply from vascular spasm or by disease of the optic disk, to inject into the back of the orbit 1 mg. of atropin. If the atrophy is of spastic origin, the visual field enlarges and the sight improves within half an hour after the injection. Otherwise, the injection is without effect. Atropin is not only a valuable help in diagnosis, but is also extremely useful in treatment. All his patients with tabetic atrophy of the optic nerve have been improved by these orbital injections of atropin.

Asher, L., Abelin, I., and Scheinfinkel, N. PERMEABILITY AND SYMPATHETIC INNERVATION. [Klin. Woch., May 13, 1924.]

In an experimental research conducted upon cats these authors extirpated one cervical sympathetic and produced salivation by injection of pilocarpin. Both submaxillary glands secreted equal amounts of saliva but that from the operated side contained one-half as much chlorids as the saliva from the sound side. They conclude as to some function of the sympathetics regarding secretion of solids.

Hoffmann, R. PHARMACOLOGY OF THE VEGETATIVE NERVOUS SYSTEM. [Wien. Arch. f. kl. Med., 1923.]

Hoffmann finds that the effect of varied use of adrenalin-pilocarpin depends upon the order in which the substances are employed. The effect of pilocarpin upon the salivary or the sweat secretion in persons adrenalized is lowered but adrenalin administered afterward strengthens the effect. Pilocarpin administered after adrenalin strengthens the glycosuric action of the adrenalin, while administered previously it inhibits it.

Brunn, F., and Mandl, F. PARAVERTEBRAL INJECTIONS. [Wiener klin. Woch., May 22, 1924. J. A. M. A.]

Brunn and Mandl had favorable results with paravertebral injections of 10 or 15 c.c. of a 0.5 per cent solution of procain in gallbladder and renal colics. Four patients with angina pectoris were relieved for months; two only for days. Three of them, who had been injected in the second and the fourth thoracic interspaces, suffered for several hours from dyspnea and fever. The injection requires skill and caution to avoid the spinal canal and the pleura. Cases have been reported in which the injection had been made into the spinal cord!

Weiss, Soma. A STUDY OF THE ACTION OF CALCIUM IN EXPERIMENTAL COCAIN POISONING. [Journal A. M. A., Oct. 13, 1923.]

Experiments made by the author to determine whether calcium salts exert any antagonistic action to that of cocain on the heart show that calcium chlorid exerts no antagonistic action toward that of cocain on the frog's heart, but, on the contrary, the combination is more toxic

than is an equal amount of cocain alone, presumably because of the more rapid absorption of the hypertonic solution. From the results of these experiments, as well as those of Karl Mayer himself, it would appear that there is no evidence that calcium salts exert any antagonistic action to that of cocain.

Brinkman, R., and van Dam, E. HUMORAL TRANSMISSION OF EXCITATION ON STIMULATING THE VAGUS AND SYMPATHETIC NERVE OF THE FROG'S HEART. [*J. Physiol.*, LVII, 378.]

It has been shown that if the fluid contained in a frog's heart during very strong vagal stimulation was transferred to a second frog's heart, vagal inhibition was seen in the latter. The effects of sympathetic stimulation in the one could likewise be transmitted to the second. Loewi put forward the conception that stimulation of a nerve produced a special organic substance which was directly responsible for the nerve action. The present study approaches the question from a physico-chemical standpoint in order to test out the hypothesis. Stimulation of the vago-sympathetic nerve, if accompanied by a vagal effect, was always associated with a decreased surface tension of the fluid leaving the heart; while if the sympathetic action preponderated, an increased surface tension was found if this had been decreased beforehand by vagal stimulation. The functional antagonism of vagal and sympathetic action in the heart is therefore reproduced in the perfusing salt solution as a physico-chemical antagonism. They conclude from the results obtained that vagus stimulation is accompanied by a production of an organic substance which can be detected in the perfusing fluid, but that this substance fails to appear if the sympathetic is stimulated.

Herring, P. T. THE "LAW OF FLUCTUATION," OR OF ALTERNATING PERIODS OF ACTIVITY AND REST IN LIVING TISSUES. [*Brain*, July, 1923.]

The term "fluctuation" is applied to the alternation of periods of full activity and complete rest which appears to be a property of the cell units of many, and possibly of all, living tissues. The possession of this property by the cells which constitute the walls of the capillary blood vessels has been demonstrated by Krogh, and it has been observed in the glomerular capillaries of the frog's kidney by Richards. Its occurrence in voluntary muscle has been shown by Barbour and Stiles. The condition was noticed many years ago by Mackenzie in the constantly varying borders of areas of hyperesthesia which are found in the skin in some cases of spinal lesion. The assumption of a "law of fluctuation" appears to be a necessity in the case of all tissues which are subject to the law of "all or nothing." It is therefore specially applicable to muscle and nerve, the cell units of which, as demonstrated by the work of Keith Lucas, Adrian, and Forbes, are governed by this law. The law of "all or nothing" demands that each cell unit, when in action, should

give its maximal response to any stimulus which is capable of producing a response, there being no gradation in the individual unit between complete activity and complete rest. Gradation of activity in an organ made up of units subject to the law of "all or nothing" is due to varying numbers of units, or groups of units, being brought into action. The "law of fluctuation" demands an alternation of the units engaged, so that in the performance of a moderate amount of work all parts of the organ participate in turn, first one part and then another taking up the work in rotation. Such a mechanism prevents undue fatigue of the individual units, distributes the work uniformly over the constituent elements of an organ, and provides a reserve of units, all of which can be brought into action simultaneously when the need arises, and have not suffered from long periods of disuse.

Reasons are advanced for the assumption that fluctuation must occur in the receptors and synapses of the reflex arc. An explanation is offered of the presence of numerous branches on the afferent side of each neurone, and their function is contrasted with that of the branches on the efferent side of the neurone. It is suggested that multiple receptors and synapses are necessary for the economical use of the nonfatigable nerve fiber. The nerve impulse is initiated by the receptor, and its frequency may be of the utmost importance in the production of the end result. The branching on the efferent side permits a multiplication of the end results, and an irradiation in the central nervous system which is limited by the resistance of the synapses met with. The cause of fluctuation is ascribed to the occurrence of slight fatigue in the receptors and synapses, and possibly in the receptive substance between the efferent neurone and the effector organ. In some cases fluctuation may be ascribable to fluctuation in the capillary circulation. The possibility still remains that fluctuation may be an inherent property of the tissue cell. Examples are given of fluctuation in nerve, muscle, and glands, and its physiological and clinical importance is emphasized. [Author's abstract.]

Herring, P. T. REGULATING AND REFLEX PROCESS. [Brit. Med. JI., Oct. 20, 1923. J. A. M. A.]

In a further study Herring says that there is abundant evidence that the action of drugs on the nervous system is exerted on the synapses or on the receptive substances between the endings of the efferent neurons and the organs they innervate. Fatigue is brought about by the action of waste products formed during activity on the same structures. There is also evidence that certain toxins have a like action. Different substances pick out the synapses of different parts of the nervous system, and spread to others in definite manner. The action may be first manifested on the synapses in the highest level of the nervous system, as in the case of chloroform, and gradually spread to the lower levels involving the synapses on the pathways of the vital reflexes last of all;

or it may begin in the receptive substances and cause death from paralysis of the muscles of respiration, as happens in poisoning by curare. It may gradually spread to the higher levels, as in atropin poisoning or in the continued use of overdoses of digitalis. Herring suggests that many of the manifestations of ill health are due to toxins acting on different parts of the nervous system. The symptoms of botulism are explainable in this way and their serious nature is due to the fact that the toxin involves the synapses on the reflex arcs of the vital processes at an early stage. Other and more common conditions are the results of toxins acting on less vital processes. Forms of exhaustion, nausea, lack of appetite, changes in temperature, cardiac, vasomotor and visceral disturbances may sometimes be ascribable to the action of toxins on the synapses of the pathways which are concerned in regulating normal processes. Disturbances of the normal processes are to be recognized by the sensations experienced by the patient and by the alterations that take place in the reflexes, especially those of the viscera: cardiac, vascular, respiratory or alimentary. It is imperative, therefore, that these effects, whether subjective or objective, should be recorded and analyzed carefully.

Leriche, R. POSTTRAUMATIC LOSS OF VASOMOTOR BALANCE. [Lyon Chir., December, 1923.]

Irregularity in vasomotor control is a well known syndrome in trauma. Its mechanism is here studied by Leriche and illustrated by charts which tend to show that the primary upset of the local vasomotor balance is more pronounced and lasts longer at points with the most abundant vasomotor innervation—trauma affecting the fingers rather than the root of the limb, for example. Cicatricial retraction disturbs the balance still further. The oscillometer was used to register the changes in the vessels.

Gautrelet, J. PARASYMPATHETIC PARALYSIS. [Médecine, December 1923. J. A. M. A.]

Gautrelet states that nigrosin is an excitant of the parasympathetic nervous system. No drop of blood pressure was noted in dogs previously injected with peptone or colloidal silver after successive injection of thionin and nigrosin. During twenty-four hours the parasympathetic system was in a state of less excitability. This condition succeeds to the vasodilatation which determines the shock and discloses the parasympathetic excitation. He finds that nearly all the antianaphylaxis procedures seem to act by provoking paralysis of the parasympathetic.

De Castro, F. EVOLUTION OF VERTEBRAL AND PRE-VERTEBRAL SYMPATHETIC GANGLIA. [Trab. d. lab. invest. biol., XX, 113. Med. Science.]

In this voluminous paper De Castro revises our present state of knowledge of the morphology of sympathetic ganglion cells in man. His

investigations were chiefly carried out in the human fetus from the sixth month of intrauterine life to birth and in young subjects from one to about thirty years of age. The results obtained are illustrated by 67 figures on 48 plates and summarized in the following conclusions. (1) The nerve cells of one and the same ganglion of the vertebral chain do not all develop at the same time, but in successive phases, so that mature cells are frequently found next to undifferentiated ones. Particularly in the superior and inferior cervical ganglia of the fetus of the sixth month, most of the developing nerve cells are not as yet provided with a connective tissue capsule and are often arranged in neuroblastic colonies similar to zoöglœæ. The process first to form is the axon with the production of unipolar cells which presently become transformed into multipolar. The dendrons arise at first from portions of the cytoplasm situated next to the cone of origin of the axon and then from other points. Within the neuroblastic colonies thin nerve fibers are seen ending in fine ramifications. In the fetus of the seventh month the superior cervical ganglion possesses the greatest number of differentiated cells. (2) In the vertebral ganglia of the fetus of the sixth and seventh month occur giant nerve cells provided with from two to seven nuclei, some of which apparently are in phases of amitotic division. Other less voluminous, binucleated cells are characterized by a symmetrical arrangement of their opposite processes and by axial sulci of their cytoplasm. It is, however, uncertain whether these various phenomena actually lead to a multiplication of the ganglion cells in the later phases of intrauterine life. (3) The dendrons first formed grow rapidly into robust protoplasmic processes which ramify either next to their cells of origin or at some distance within the ganglion. From about the seventh month till birth, the primordial dendrons give rise to secondary processes, which slowly develop into ramified collaterals. These ramifications remain next to the cell body of origin and form synapses with fibers proceeding from the spinal cord (preganglionic fibers of Langley). (4) The development of the connective tissue elements and the formation of the cell capsules proceed *pari passu* with that of the ganglion cells. In the neuroblastic colonies only a few connective tissue elements (satellites) are noticed; they rapidly multiply as the dendrons are formed, and the more abundant the protoplasmic processes, the greater is the number of satellites with which the ganglion cells are provided. (5) The large dendrons above mentioned do not end at random in the intercellular spaces but appear to have a sort of predilection for certain groups of cells. They frequently give rise to complicated glomerular structures which comprise two or more cells and their processes, and are, up to a point, delimited by a common connective tissue capsule ("isodynamic groups"); at other times these dendrons ramify at a varying distance from their cell of origin and form, with similar processes from other cells, inextricable interlacements which also are up to a point delimited by a common

capsule ("receptory plaques"). These observations point to the existence of a certain degree of functional differentiation with single ganglia. (6) As shown by Cajal, the axons of sympathetic ganglion cells (postganglionic fibers) do not, as a rule, possess collaterals. Through the grey rami communicantes they proceed towards either the periphery or the corresponding spinal ganglia. Some of them pass through the spinal ganglia and enter the posterior roots, ending probably on meningeal blood vessels, but they never give rise to arborizations investing spinal ganglion cells as described by Dogiel. According to De Castro the pericellular baskets or nests observed by Dogiel and other authors in spinal ganglia are not sympathetic but sensory in nature and are probably formed of fibers arising from autochthonous spinal ganglion cells. De Castro also denies the existence of commissural sympathetic neurons. (7) The preganglionic fibers arborize in fetal sympathetic ganglia round the protoplasmic plexuses of the most developed cells. The pericellular preganglionic nests develop particularly between birth and puberty when similar arborizations are found also round the so-called receptory plaques. In the human fetus of the seventh, eighth, and ninth months some large preganglionic fibers can be observed mixed with the postganglionic fibers in the peripheral rami of the superior cervical ganglion. These fibers are motor in character and have nothing in common with those which reach the ganglion through the cervical sympathetic trunk; it is, however, uncertain where their cells of origin are situated. (8) In sympathetic ganglia, afferent (sensory) medullated and nonmedullated fibers are found, the trophic centers of which are situated in the corresponding spinal ganglia. Some of these fibers terminate in sensory endings and special end organs in the stroma of the sympathetic ganglia. (9) In the large mammals, but chiefly in monkeys, the same fundamental types of sympathetic ganglion cells are found as in man; they are, however, morphologically simpler and, except in the monkey, almost entirely lacking in short protoplasmic processes. [C. DA FANO.]

Moro, E. TUBERCULIN AND THE VEGETATIVE SYSTEM. [Klin. Woch., December 3, 1923.]

This article calls attention to the author's 1908 paper in which he advanced the idea that the tuberculin reaction is caused by a specific increase in the irritability of the vegetative nervous system, which branches and how he does not further specify.

Dresel, K. DISTURBANCES OF VEGETATIVE SYSTEM. [Klin. Woch., February 19, 1924.]

Newer conceptions of pathology based upon a deeper appreciation of the vegetative nervous system are abundant from Dresel. In the present one of many studies he deals with the changes of calcium and potassium concentration in vagotonia and sympathicotonia. In vagotonia, the tissues are more alkaline and contain less colloidal calcium and more

potassium. The blood is more alkaline and has little potassium, little ionized calcium, and more total calcium. In sympathicotonia all these changes are the reverse. They allow differentiation of spasmophilia from parasympathetic irritation and real tetany.

Brüning, F. SURGERY OF VEGETATIVE NERVOUS SYSTEM. [Med. Klin., May 20, 1923.]

Periarterial sympathectomy is one of the more recent surgical enthusiasms. The present paper deals especially with the theory of indications for and results of periarterial sympathectomy. Brüning is conservative and believes that extirpation of the cervical sympathetic for epilepsy, glaucoma, and exophthalmic goiter had no good results. In angiospastic conditions however, especially in angina pectoris, the operation has given some surprisingly favorable results.

Müller, E. F. THE VAGUS AND SEPTIC DISEASES. [Münch. med. Woch., September 14, 1923.]

This paper deals with certain newer suggestions as to the part played by the vegetative nervous system in infectious processes. He here states that an infectious focus acts on the bone marrow by reflex action through the autonomic system. The bone marrow starts to produce more leukocytes, and they are deposited in the vicinity of the focus again by the preponderance of the autonomic tonus in the tissues infected.

Duschl, L. HUMORAL TRANSMISSION OF NERVOUS IMPULSES. [Münch. med. Woch., October 12, 1923.]

Duschl experimented on rats in parabiosis, and injected blood from the heart of cats and rabbits into other individuals. He confirms Loewi's discovery of the slowing down of the pulse rate after injections of blood from an animal whose vagus had been stimulated.

Jennings, H. S. INHERITANCE OF ACQUIRED CHARACTERS. [Science, 1924.]

An airing of the biological problem of the inheritance of acquired characteristics is now taking place. Jennings says that Kammerer, an eminent biologist, of Vienna, is in this country on a lecture tour and his arguments and experiments in favor of the transmission of environmental effects have created considerable public as well as scientific interest.

"Dr. Paul Kammerer has carried on more extended and serious experimental investigations on the inheritance of acquired characters than any one else has ever done," said Professor Jennings. "For many years continuously he studied, mainly in amphibians and reptiles, the changes induced by altered environments on their instincts, markings and structural features, and the heritability of these changes. The

accounts of these investigations are published with great detail in standard journals of research; they report that in many different cases such 'acquired characters' are inherited.

"In the interest of the solidity of science, any investigator who brings revolutionary conclusions, opposed to the common experience of workers in the same field, meets skepticism and thoroughgoing criticism; his work is not accepted until it has been sifted for all possible sources of error, and has finally been confirmed or refuted by the work of others. Though inconvenient, the history of science shows this to be necessary, and no investigator can escape it. Such a sifting the work of Kammerer is now undergoing. The materials with which he works are extremely variable in their genetic and other phenomena; some investigators hold it probable that unconscious selection among the variations, rather than the inheritance of acquired characters, may account for Kammerer's results. Attempts have been made to point out in his work errors, which, if they are typical, would raise a presumption of inadequate care in so difficult and complex a field; but none that are fatal to his general conclusions have yet been demonstrated. A number of investigators are repeating crucial parts of his work; until their reports come in a final judgment is not possible. Some eminent students of modern genetics feel certain of the overthrow of his conclusions; some eminent biologists in other fields believe strongly in their validity. If confirmed, the work would of course be of tremendous importance.

"The recent reports by Pawlow, Guyer, Stockard, Griffith, Kammerer and others show that we are in for another upheaval and airing of the problem of the inheritance of acquired characters. Since this is upon us, it is desirable that it be made as thorough as possible. Americans should therefore welcome the opportunity of hearing Dr. Kammerer's conclusions from his own mouth; experience has shown that the personality of the worker is not irrelevant in such fields to the question of how he came to his conclusions. The history of former upheavals of this matter does not predispose one to predict a favorable outcome of the test now in progress. But while we wait, Dr. Kammerer must be given credit for the most courageous and thoroughgoing attack that has ever been made of this important problem; for bringing to light many important matters, whatever their final significance; and for giving a powerful impetus to further investigations in this field."

Cannon, Walter B. NEW EVIDENCE FOR SYMPATHETIC CONTROL OF SOME INTERNAL SECRETIONS. [*American Journal of Psychiatry*, Vol. II, No. 1, July, 1922, pp. 15-30.]

In the annual address before the American Psychiatric Association at Quebec Cannon reviews the hypothesis, as old as Aristotle, of the nervous mechanisms of emotional reaction which he believes at least

for unpleasant experiences lie not in the neopallium, but in the older portions of the nervous system which exist in all the vertebrates, explaining why the superficial expressions of emotion are so similar in such widely different animals as the dog, the cat and man. This justifies the use of the lower animals in a study of the data of the emotional displays and likewise stimulates the hope of finding similar conditions and similar analyses in human beings. [MENNINGER.]

Ullmann, H. HEREDITY OF VEGETATIVE ASTHMATIC SYNDROMES. [Deutsches Archiv. f. klin. Med., April, 1924.]

This is an interesting hereditary study of asthmatic and other vegetative nervous system characters in general showing close interrelationships between asthma and certain anomalies of vegetative system control. The psychological data are too fragmentary for analysis, but should be collated in the picture.

Draper, George Dunn, Harbert L., and Seegal, David. STUDIES IN HUMAN CONSTITUTION. [Journal A. M. A., Feb. 9, 1924.]

This paper deals only with the study of morphology as applied to clinical medicine. Observations made on the human types found in recent extensive epidemics of infantile paralysis and meningitis, as well as of other types repeatedly seen suffering from such well recognized disease entities as pernicious anemia, cerebrospinal syphilis, gastric ulcer and gallbladder disease, lead the authors to attempt an organized investigation of the nature of man's constitution in relation to disease. A method is presented for the application of anthropologic technic to clinical medicine. This method is applicable alike to the study of race, endocrinopathic states, or to any disease entity. The material on which this set of observations has been made consists of fifty patients with gallbladder disease, and thirty-nine with gastric and duodenal ulcer. Complete anthropometric studies were made on each individual, involving about eighty-five separate measurements. From these, forty-two indexes were calculated. The results in each disease group have been compared by means of curves which show the relative frequency of occurrence of differences in any given character. The following anatomic characters have been selected for this demonstration: 1. Ponderal index: the relation of weight to height. 2. Subcostal angle: the angle of the diverging costal margins. 3. Gonial angle: the angle formed by the ascending and horizontal rami of the mandible. 4. Anterior jaw index: the relation of anterior jaw breadth to posterior jaw breadth. 5. Anteroposterior thoracic diameter: the depth of the chest at the level of third rib. The final conclusion reached is that a constitution clinic seems to hold a useful and logical place in any general medical clinic, for it tends to equalize the distribution of investigative energies on the three basic problems—man, the lesion, and the environmental stress.

2. ENDOCRINOPATHIES.

Da Fano, C. (1) ON GOLGI'S INTERNAL APPARATUS OF THE MAMMARY GLAND. [J. Physiol., 1922, LVI, xxii.]

Da Fano, C. (2) ON GOLGI'S INTERNAL APPARATUS IN DIFFERENT PHYSIOLOGICAL CONDITIONS OF THE MAMMARY GLAND. [J. Physiol., 1922, LVI, 459; Med. Sc.]

Golgi's internal apparatus is a constant feature of the epithelium cells of the mammary gland in all stages of its physiological history. In the virginal condition the apparatus consists of one or more small reticular portions situated next to the nucleus on the side facing the glandular lumina. During pregnancy the apparatus greatly hypertrophies and shows a tendency to surround the nucleus with its network. This phenomenon seems to be brought about by the approaching hyperactivity of the cytoplasm. From the moment the young are born, and all through lactation, the apparatus is still hypertrophic, in part fragmented and shifted and stretched in various directions. The hypertrophy and partial fragmentation are very likely connected with the activity of the cells; the shifting and stretching appear chiefly due to the increased intracellular pressure. These facts are against the identification of the apparatus with a fixed system of intraprotoplasmic canaliculi. In the period of involution after lactation the epithelial cells undergo deep changes, during which the apparatus appears to become transformed into peculiar roundish, oval, or elongated shapes, delimited by a granular or filamentous argentophil material. Most of these cells are eliminated with their deformed apparatus. Some remain as the permanent epithelium of the gland at rest, and in these cells an apparatus is found similar to that of the virginal condition. It is suggested that the apparatus of the surviving cells is rebuilt from the fragmented and perhaps fluidified materials out of which the old one was formed. As far as the mammary gland is concerned, no fact was noted in favor of the supposition that part of the apparatus is thrown off from the cells together with other products of their secretory activity. But the continuous passage of detached epithelium cells with their apparatus into the glandular lumina and ducts is assumed to mean that in this way the apparatus takes an indirect part in the function of the gland. [Author's abstract.]

Jordan, H. E. THE HISTOLOGY OF A TESTIS FROM A CASE OF HUMAN HERMAPHRODITISM, WITH A CONSIDERATION OF THE SIGNIFICANCE OF HERMAPHRODITISM IN RELATION TO THE QUESTION OF SEX DIFFERENTIATION. [Am. Jl. Anat., Vol. XXXI, No. 1.]

The testicle constituting the material of this investigation was removed from the right inguinal canal of a married woman forty-five years of age. A similar tumor can be palpated on the left side. The

testis is slightly less than normal size. It contains chiefly interstitial tissue, with scattered remnants of seminal tubules. The associated epididymis is approximately normal in histologic structure, except for a small nodule of smooth-muscle tissue on the caput. The ductus deferens ends blindly within this nodule. The subject (individual B) is one of a family of hermaphrodites, including at least three similar anomalous individuals in two generations, at least one of which (individual A) is a true anatomic hermaphrodite, with both testes and at least one ovary. Individual B is the sister of the apparently normal mother of individual A. Two testicles were removed from individual A, now aged twenty-seven years, nine years ago. Both individuals A and B lack a uterus. The external genitals are approximately normal female organs. In another sister of B similar tumors can be felt in the groins. These three hermaphrodites are shy and neurotic, with a tendency to masculinity in temperament and features.

Individual A, described by Whitehead (1913), is one of three unequivocal cases of true anatomic hermaphroditism in man. The other two instances are described by Sheppard (1920) and Polano (1920), respectively. On the basis of the close kinship and the anatomic similarity to individual A, and the fact that she had a degree of female temperament, notwithstanding two testes, sufficient to support a married life of fifteen years, individual B may be assumed also to have possessed an ovary like individual A. This family history of hermaphroditism indicates the operation of a genetic factor. The occurrence of true anatomic hermaphroditism in man (three cases) and in certain higher mammals (*e.g.*, hogs and goats) forms the basis of a discussion of sex determination and differentiation. The author believes that this anomalous condition in higher forms represents an atavistic expression of a normal condition in certain lower vertebrates (*e.g.*, tunicates, cyclostomes, probably some amphibia). It represents further the sporadic adult expression of the universal embryonic bisexual potentiality, following failure of inhibition and later suppression of one of the alternative sex primordia, permitting thus an approximately equal development of both primordia as the result of a relatively balanced condition of both inherent sex potencies.

The author summarizes his conclusions as follows:

"The theory of sex determination that can include these facts (of hermaphroditism) consistently with the facts concerning the sex chromosomes and sex hormones is one that regards the definitive sex of the mammal as the result of the superposition, phylogenetic and ontogenetic, of a sex bias inherent in sex chromosomes upon a more fundamental bisexual potency with its separate germinal factor. Hermaphrodites are the result, according to this interpretation, of the imperfect dominance of the germinal factor representing the differential type of metabolism of one of the two diecious possibilities over the germinal factor of hermaphroditism. These factors, interacting with their environments, both intra-

and extracytoplasmic, determine the type and grade of metabolism underlying maleness, femaleness, and hermaphroditism." [Author's abstract.]

Stanley, L. L. RESULTS OF TESTICLE SUBSTANCE IMPLANTATION. [Endocrinolog., VI, No. 6; J. A. M. A.]

The results of 1,000 implantations of animal testicular substance in 656 human subjects, including seven females, are reported by Stanley. The greater number of subjects received only one injection, although some received as many as seven injections. Striking objective improvement was seen in numerous cases of general asthenia, acne vulgaris, asthma, and senility. Subjective or objective improvement was seen in various cases of rheumatism, neurasthenia, poor vision, and a few other conditions. The results, as a whole, are tabulated. In general, testicular substance seems often to have a beneficial effect in relieving pain of obscure origin and in the promotion of bodily well being. The operation is practically painless and harmless. The testicular substance was cut into strips with a knife or cork-borer, in sizes suitable for filling the pressure syringe. This instrument is similar to the one devised by Beck for paraffin injection. By means of a dental syringe with a No. 16 needle, $3\frac{1}{2}$ inches long, the semisolid testicular substance was injected underneath the skin of the abdomen. There were comparatively few sloughs, and the patient was not subjected to a week's hospital inconvenience. The testicles of goats, rams, boars, and deer have been used. So far as can be determined, there is very little difference in the effects produced by testicular material obtained from the different animals.

II. SENSORI-MOTOR NEUROLOGY.

1. CRANIAL NERVES.

Sanz, E. Fernández. TRIGEMINAL NEURALGIA. [Siglo Médico, Nov. 4, LXX, No. 3595; J. A. M. A.]

Fernández Sanz reviews certain accessory symptoms in trigeminal neuralgia which throw light on the diagnosis and the prognosis. He emphasizes the necessity for careful search which may reveal some removable primary cause for what seems to be essential neuralgia. With pain in the abdomen the muscles stiffen, but with trigeminal neuralgia the muscles contract and work and grimace irregularly, and the eyes, the teeth, the whole head may share in the paroxysm. This motor restlessness during the attack contrasts with the immobility during the intervals, the subject fearing to bring on a paroxysm. In a recent case the facial muscles were permanently contracted, especially the commissure on the side of the pain. The neuralgia was of six years' standing; the per-

manent contracture changed to excessive grimacing when the attacks came on. The condition in this case seems to be more like the stiffening of the abdominal wall with visceral pain, and it suggests that there is an element of neuritis in the neuralgia in this case. The conjunctival and corneal reflexes may be exaggerated or attenuated; in the latter case the prognosis is graver as this indicates a deficit in functioning. A zone of hyperesthesia is another sign pointing to stable lesions. Hypoesthesia, on the other hand, points to a deficit.

Davis, Loyal E. THE DEEP SENSIBILITY OF THE FACE. [Proc. Amer. Assoc. Anatomists, in *Anatomical Record*, XXV, April, 1923, p. 125.]

Davis has investigated the deep sensibility of the face to determine whether or not pressure-pain sensibility was lost after division of the sensory root of the trigeminal nerve, and if this type of sensation is not lost, to ascertain whether or not the fibers which transmit pressure-pain travel cephalad in the facial nerve. An intracranial division of the sensory root of the fifth or complete destruction and avulsion of the Gasserian ganglion was performed on twenty-five cats. After recovery from the operation sensation in the face was tested for by the use of the electric current. In each instance there was no response upon the side of the lesion to superficial stimulation over the trigeminal area. If the electrodes were thrust into the muscles of the face and stimulation applied, the response was immediate. At a second operation the facial nerve on the same side was severed at its exit from the stylomastoid foramen. After recovery there was no response either to superficial or deep stimulation by the electric current. Deep pressure-pain, as elicited by the algometer, was present without exception in fifteen clinical cases following trigeminal neurectomy, although superficial cutaneous sensibility was lost. Two cases were observed in which there was a paralysis of both the fifth and seventh cranial nerves on one side, with loss of both deep and superficial sensibility. Davis concludes that afferent fibers which transmit pressure-pain sensation from the face pass cephalad in the facial nerve. [Leonard J. Kidd, London, England.]

Olmsted, J. M. D. TASTE FIBERS AND THE CHORDA TYMPANI NERVE. [Journal of Comparative Neurology, June 15, 1922.]

Olmsted records further investigations on the relationship of taste fibers to the chorda tympani nerve. The presence of taste fibers has been demonstrated in several ways. In the first place, it has been shown that loss of the sense of taste occurs in the anterior part of the tongue after injury or severance of the nerve. Secondly, an instance has been recorded in which sensations of taste were aroused in a patient by direct stimulation of the chorda tympani. It has also been shown that taste buds disappear from the circumvallate papillae on section of the glossopharyngeal nerve and from the fungiform papillae of the anterior part of the tongue on

section of the lingual nerve. These taste buds disintegrate and are removed by phagocytes within eight days after cutting the nerves. The writer shows that this change in the taste buds in the fungiform papillae is due to included fibers of the chorda tympani nerve. He points out that severance of the lingual nerve proximal to the entrance of the chorda tympani gives rise to no change, whereas in two instances division of the chorda tympani itself without injury to the lingual nerve was followed by the disintegration of the taste buds of the fungiform papillae.

Liebermann, T. v. FACIAL PARALYSIS FROM CAUTERIZING WITH CHROMIC ACID. [Deut. med. Woch., July 7, 1922.]

T. v. Liebermann points out that the practice of cauterizing granulation tissue with chromic acid in the neighborhood of the facial nerve is dangerous, and he records a case in which paralysis of this nerve was traced to poisoning with chromic acid. The patient was a man, aged thirty-two, operated on for acute mastoid disease. As the operation wound did not heal satisfactorily, the granulations which had formed were touched with chromic acid under cocaine anesthesia. Facial palsy developed.

Gerard, Margaret Wilson. AFFERENT IMPULSES IN THE TRIGEMINAL NERVE. [Amer. Assoc. Anatomists, in Anat. Record, XXV, April, 1923, p. 130.]

In thirty-nine cases of occlusion of the posterior inferior cerebellar artery collected from the literature loss of pain and thermal sensibility in the face was always correlated with a destruction of the spinal trigeminal tract or nucleus. Reversely, a case of syringomyelia associates a loss of tactile sensibility with a destruction of the main sensory nucleus. Experimentally, it is found (in cats) that reflexes due to painful stimuli (struggling, pupil dilatation, rise in blood pressure) are lost upon severance of the spinal fifth tract, while tactile reflexes (sneezing) remain intact as long as the path of the main sensory nucleus is not injured. These results indicate that the spinal fifth nucleus is connected with pain and temperature stimuli, while the main sensory nucleus is concerned with tactile stimuli. Since the fibers passing through the fifth nerve bifurcate, one branch destined for the main sensory nucleus and the other for the spinal nucleus, the authoress suggests that all types of impulses may run through a single fiber, but are sifted at the synapses in the various nuclei, those arising from tactile stimuli being relayed from the main sensory nucleus, and those for temperature and pain being relayed from the spinal nucleus. [Leonard J. Kidd, London, England.]

Betchov. VESTIBULAR NYSTAGMUS. [Rev. Neur., XXXIX, No. 3.]

Vestibular nystagmus can be conceived as a reflex of looking in the direction contrary to an active or passive rotation of the body. The

reason of this act is the necessity of maintaining the projection of the external world on constant points of the retina. Simulated rotation (hot or cold irrigation of the ears) puts the same reflex into action. This is the slow component of the nystagmus. While the reflex of looking sideways is provoked, the contrary movement is inhibited. If, for example, a rotation to the right provokes a look to the left, it inhibits at the same time the oculomotor system of looking to the right side. The "right look system" is consequently in a state of hypotony and will answer in a dysmetric fashion to any solicitation. This is the reason of the quick component of the rhythmic nystagmus. [Author's abstract.]

Bastai, F. BÁRÁNY'S POINTING TEST. [Revista Critica di Clinica Medica, Vol. XXIII, p. 85; J. A. M. A.]

The case reported by Bastai testifies that certain symptoms supposed to be characteristic of cerebellar disturbance alone may be encountered with injury of the zone of Rolando. There are severe jacksonian epilepsy of the left side, of traumatic origin. The past pointing tests gave a crossed response. With cerebellar lesions it is usually homolateral. The literature on cortical and cerebellar symptoms is reviewed in connection with this case.

2. PERIPHERAL NERVES.

Capps, J. A., and Coleman, G. H. LOCALIZATION OF THE PAIN SENSE IN THE PARIETAL AND DIAPHRAGMATIC PERITONEUM. [Arch. Int. Med., XXX, 778. Med. Sc.]

The authors briefly review earlier observations on this subject. Their own observations were carried out on the human subject, patients with ascites being chosen at first because of the distension of the abdominal wall, but later they employed the method of air injection into the peritoneal cavity. The air forces the viscera to the bottom of the abdominal cavity, leaving a large dome-like area free for testing. The actual testing was carried out by the introduction of a long curved silver wire passed through the cannula of a trocar, which is thrust into the abdominal cavity. The curve of the wire allows of the exploration of the parietal and of the diaphragmatic peritoneum. They find that the regions of parietal peritoneum and underlying serosa explored are sensitive to pain from strong pressure of a smooth-ended wire, or light pressure or lateral movement of a pointed wire. The pain is localized with considerable accuracy by the patient, the error being less than one inch. They find no evidence of a pressure sense in the parietal peritoneum. Exploration of the diaphragmatic peritoneum gave identical results. The localization of pain is never in the diaphragm itself, but is always referred to some distant part. Thus, stimulation of the central part gives a sharply limited pain somewhere on the ridge of the trapezius, while stimulation of the margins

gives rise to pain over the lower costal region and that portion of the abdominal wall adjacent to it. Pain is not observed along the course of the phrenic nerve. One interesting point is that this pain of peritoneal origin can be accurately localized by the subject. [F. M. R. Walshe.]

Bailey, P. RECENT DEVELOPMENTS IN ELECTRODIAGNOSIS. [Am. Archives of Neur. and Psych., IX, No. 4, p. 436.]

Bourguignon's chronaxie determination has proved its value in the study of the normal and pathologic physiology of the neuromuscular mechanism. Chronaxie is defined as the time of passage of current necessary to obtain the threshold with an intensity double that of the rheobase. The rheobase is the intensity necessary to obtain the threshold of excitation on closing a prolonged constant current (the classic galvanic threshold). In order to determine the chronaxie, it suffices to find the galvanic threshold with the closure of a key, then double the voltage corresponding and determine the time of passage of current necessary to obtain the threshold with a voltage double the rheobasic voltage. For this purpose it is necessary to have at one's disposal a method of obtaining wave lengths in the neighborhood of 0.00001 of a second. In any segment, the chronaxie is the same for all muscles which act synergically. Nerves and muscles having the same chronaxies in a limb are attacked or respected by the same morbid agents. In the case of a section or other injury to a nerve, determination of the chronaxie is of value in following the condition of the muscle itself and determining the effect of our efforts to keep the muscle in good condition. In the diagnosis of primary affections of the muscles, such as myopathies and Thomsen's disease, the chronaxie may be found ten to fifteen times its normal value before any slowing of the contraction of the muscle is visible.

Söderbergh, G. NEUROLOGY OF THE ABDOMINAL WALL. [Hygiea, LXXXV, No. 1.]

Söderbergh has contributed during the past decade a number of studies on the motor functions and reflexes in the abdominal walls. In his fifteenth publication he reviews the whole subject and shows their practical application in five cases.

Gordon, Alfred. SENSORY DISTURBANCES LIMITED ONLY TO A PORTION OF DISTRIBUTION OF THE ULNAR NERVE. [Philadelphia Neurological Society, Dec. 22, 1922.]

Miss E. G., age thirty-one, presents no special previous history. Present trouble started at the age of twenty. In the initial attack the fifth finger of the left hand became pale and cold, then bluish and swollen. It was incised on account of severe pain and bloody serum was found. Wound healed by first intention. Three months later had a similar attack that involved the fifth and fourth fingers. Three years later the

fifth, fourth, and third fingers became involved. Five years later she had a similar involvement of the second, third, fourth, and fifth fingers. At each attack it was thought advisable to incise her fingers for relief of severe pain. Two years ago patient noticed that when she lay upon her left shoulder and arm the upper extremity became numb and ached. This lasted ten to fifteen minutes. In December, 1920, she noticed that she had difficulty in grasping and holding objects with her left hand. It was at that time that she recalled the loss of touch sense, that pain was lost, also temperature or the difference between hot and cold. During the last six months her arm and forearm ached at times, especially after lifting objects of some weight above her head. Since her first attacks her fingers have had a violaceous color and felt cooler. She never noticed any blisters or sores upon her fingers. Presently there is a distinct and very pronounced anesthesia to touch, pain, and temperature on the hand and wrist, covering the area of distribution of the sensory fibers of the ulnar nerve over the palmar and dorsal surfaces encroaching slightly on the median nerve. Not only the superficial sensations are abolished but there is also a total loss of all deep sensibilities, including the stereognostic sense. There is no atrophy of any of the muscles of the arm, forearm, and hand. There is only a certain amount of weakness in the hand. The brachial plexus above and below the clavicle, also in the axilla, is tender to pressure. From every other standpoint there is nothing else in the case worth mentioning. All the tests, including the Wassermann, have been negative. The case is interesting and quite unusual in view of a strict limitation of the sensory disorder and of its intensity, also in view of the absence of any other muscular disorder, notwithstanding the duration of the disease. There has never been any trauma in the history of the case. An X-ray picture of the thorax shows a slightly exaggerated curvature of the first rib. Stookey, in his recent book on peripheral nerves, mentions disorders of the brachial plexus with a perfectly normal thoracic first rib, but in which fibrous bands have been found on the anterior end of the rib pressing directly upon the lower cord of the brachial plexus. Present case may be one of this category. [Author's abstract.]

Burt, J. B. SCIATICA. [Br. M. J., March, 1923.]

At a meeting of the Buxton Medical Research Society held at the Devonshire Hospital on February 5th, Dr. J. B. Burt, in opening a discussion on sciatica, pointed out that sciatica was a symptom and not a disease. It was perhaps the most interesting condition treated at the Devonshire Hospital. He preferred dividing sciatica into trunk sciatica and root sciatica. Primary sciatica was exceedingly rare, and neuritis and neuralgia were merely stages of one condition. The commonest cause of sciatica was fibrositis of the glutei and the fascia covering this region. This was the easiest group to diagnose and to treat. On the other hand, sciatica due to fibrosities of the pyriformis was exceedingly difficult to

diagnose and to treat. It might give rise to trunk or root sciatica. Pain on coughing or sneezing was suggestive of piriformis fibrositis. In Sweden particular attention had been devoted to this cause. Gonorrheal fibrositis of the gluteal region must not be forgotten as a fairly common cause of sciatica. Arthritis of the hip joint accounted for something like 10 per cent of the cases of sciatica. Sacroiliac disease was not so common a cause of sciatica as it seemed at first sight. Acute tenderness along the ridge of the sacroiliac joint occurred in many cases of sciatica where there was no disease of the joint. Inflammation of the bursae around the hip joint might give rise to very severe sciatica.

Root sciatica was distinguishable from trunk sciatica by (a) broad bands of pain extending from the gluteal region along the back and side of the thigh, (b) tenderness of the psoas muscle, (c) wasting of the leg muscles and glutei, and (d) sometimes by the attitude of the patient in walking. Syphilis was an important cause of this condition; it generally gave rise to bilateral sciatica.

3. SPINAL CORD.

Hiller, F. POLIOMYELITIDES APPEARING DURING AN EPIDEMIC OF INFLUENZA. [D. Arch. f. klin. Med., CXXXIX, Nos. 3, 4.]

The author reports a number of cases of myelitides which showing in time and place of appearance an epidemic character lead him to believe that the nature and etiology of these acute myelitides are closely related to those of encephalitis epidemica. They appear in combined forms with the latter and also the histological findings are analogous. The author's observations were made upon ten cases of acute myelitis occurring within a half-year. The ages of the patients varied from sixteen to fifty-four years while the sexes were about equally affected, six of the patients being male, four female. It was the gray substance of the cord which seemed to be affected chiefly if not exclusively. In four patients the illness was general with a slightly feverish condition with headache and lassitude. In two cases there was high temperature with bronchopneumonia. One case had slight gastrointestinal disturbance, in three there was sudden development from a condition of complete health. Paralysis appeared in two cases quite suddenly without previous symptoms, in seven cases within a few hours. Pure acute anterior poliomyelitis was present in six cases, diffuse acute myelitis with special involvement of the gray substance in three cases. A sudden paralysis of the bladder appeared alone in one case. Five cases were submitted to lumbar puncture with negative result. In most cases there was first rapid improvement for a short time, then a long period of slow retreat of the paralysis. There were no fatal cases but neither had any one yet completely recovered at the time of writing. There was much similarity to the Heine-Medin disease but not complete identity. [J.]

Winther, K. ACUTE POLIOMYELITIS IN ADULT. [Hospitalstidende, Vol. LXV, No. 27, p. 429.]

The clinical picture in the case here presented was that of a sporadic acute and grave Landry's syndrome. The patient died in eighteen hours after the onset of the paralysis with respiratory involvement.

Potts, C. S., and Wilson, G. CHARCOT-MARIE ATROPHY. [Am. Arch. Neur. & Psych., April, 1923. J. A. M. A.]

The pathologic changes in the case reported by Potts and Wilson corresponded with the two findings most commonly reported in cases of Charcot-Marie atrophy in which necropsies have been recorded: degeneration of the peripheral nerves and of the posterior columns of the cord. Clinically, the case showed the presence of mental changes and Argyll-Robertson pupils. The occasional appearance of these unusual symptoms in Charcot-Marie atrophy may be explained on the ground that hereditary diseases of the nervous system are, at times, blended together; hence atypical findings are to be expected.

Dunham, Horace G. AFTER-CARE OF INFANTILE PARALYSIS CASES OF THE 1916 EPIDEMIC IN BROOKLYN. [Journal A. M. A., January 27, 1923.]

During an epidemic of infantile paralysis of any size, children with obscure indisposition should be kept at rest in bed for several days until the exact nature of their condition can be determined. When paralysis supervenes, it usually appears within a very short time after the initial upset, the average in a series which was investigated being three days after the first manifestation of illness; but often the paralysis comes on twenty-four or forty-eight hours after, so that the patient with a malaise of no consequence need not be incapacitated over a long period of expectancy. Early, neglected patients should never be ignored in treatment later, regardless of the degree of involvement. It is essentially a disease of childhood, therefore in every obscure, acute illness the diagnosis of infantile paralysis should always be a mental reservation, since sporadic cases occur in the community every year. Obviously, to obtain the best results and maximum functional return, these patients must have intelligent care from the outset of their illness. Correct treatment for a definite stage applied at the wrong time is far worse than none, just as surely as exercise pushed to the point of fatigue and muscle exhaustion is distinctly harmful.

Regan, J. C., Litvak, A., and Regan, C. THE COLLOIDAL GOLD REACTION IN ACUTE POLIOMYELITIS. [Am. Jl. Dis. of Child., January, 1923.]

An examination of 132 cerebrospinal fluids taken from 42 cases of acute poliomyelitis is here reported upon. During the acute stage of the disease a positive reaction was uniformly obtained with colloidal gold

solution. The average curve was highest during the first and second weeks, after which it gradually declined, to become normal in 65 per cent of the cases by the eighth week. The reduction occurred constantly in the zone of low dilutions; in 88 per cent of the fluids examined the reaction was present between the dilutions of 1 in 10 to 1 in 320, though in fourteen fluids it extended up to the seventh dilution—that is, 1 in 640. Those cases in which a normal reduction occurred early were affected with a mild type of the disease, while those in which the curve remained elevated beyond the eighth week were generally victims of the more severe forms, with extensive and slowly improving paralysis and with moderate or marked neuritis. There was nothing characteristic in the nature of the reaction seen in cases which proved fatal, so that the test was of no value in the prognosis of a fatal issue. No correlation could be established between the amount of globulin in the fluid and the height of the colloidal gold curve; nor was there any definite relation between the latter and the number of cells per cubic millimeter. The use of the test in the differential diagnosis of poliomyelitis is discussed, and the conclusion reached that, taken in conjunction with the history, symptoms, and other laboratory data, it is one of the most valuable tests we have for the recognition of the disease.

Erlacher, P. EARLY PROGNOSIS OF POLIOMYELIC PARALYSIS. [Klin. Woch., December 2, 1922, I, No. 49.]

Erlacher introduces needles into the muscle, and determines the strength of faradic current necessary to induce a contraction. He concludes from his small number of tests, that cases which do not lose more than two-thirds of the normal irritability during the first months, have a good prognosis.

The author describes a method of direct electrical examination of paralyzed muscles by faradism in cases of acute poliomyelitis soon after the onset. He introduces needles into the muscle and induces contractions by faradic current. On the results he bases his prognosis as regards the recovery of motor power in the muscles affected. It has been shown by Perthes that at the time of operation for nerve lesions the exposed paralyzed muscle may react to a faradic current when it had ceased to react to faradism applied through the skin. Erlacher has tested the direct excitability of paralyzed muscles in poliomyelitis by means of a fine needle introduced through the skin into the muscle. By this needle he applies the faradic current directly to the muscle. He states that this method of testing can be carried out even in infants, and that the pain is not greater than that caused by the needle when a hypodermic subcutaneous injection is given. He has found that paralyzed muscles which present relatively good excitability when tested by the introduction of the fine needle recover their functions later. He gives examples of cases of acute poliomyelitis in which muscles not reacting to faradism

applied in the ordinary way through the skin, but reacting distinctly to the faradic current applied by a fine needle recovered their motor power. The author's experience has been that recovery occurs in those paralyzed muscles of which the direct excitability during the first month (after the onset of the paralysis) does not sink under one-third of the normal strength of current required for producing their contraction. But no useful recovery occurs in muscles which can only be directly excited by the full strength of the faradic current. If a relatively weak faradic current by direct needle testing gives a rapid and marked contraction the muscle is not seriously affected. If the direct faradic excitability does not sink under one-third of the normal, and if an increase of the strength of the current produces a strong contraction the prognosis is favorable.

Léri, A., and Basch, G. BABINSKI'S SIGN IN INFANTILE PARALYSIS. [Médecine, February, 1923.]

These observers have found Babinski's sign to be present in about 50 per cent of his cases of infantile paralysis. They explain it on the ground that in early stages there is a tendency for the affection to spread from the anterior horns of the cord to the pyramidal tracts.

Field, C. G. ANTERIOR POLIOMYELITIS. [Jl. Iowa State Med. Soc., February, 1923.]

The author believes that the relative immunity of adults is probably conferred by unrecognized attacks of the abortive types of the disease. The increasing virulence of epidemics is emphasized. The thirty cases reported occurred chiefly in the late summer months and ranged in age from one and one-half to twenty-seven years. The symptoms in order of frequency were: headache, stiff neck, constipation, vomiting, dysuria, tremor of tongue, sleeplessness, Kernig, distention, stupor, irritability, anorexia and diarrhea. Paralysis occurred between the second and seventh days, and in five was of the ascending type. The lower limbs were by far the most frequently affected. The leukocytes varied between twelve thousand and twenty-one thousand. A high count seemed to indicate a grave prognosis. The cerebrospinal fluid was practically always under increased pressure and the cells uniformly increased. Two of the fluids were yellow in color. Some of the cases were diagnosed "summer flu" during the febrile period preceding the attack. The writer believes that such cases should be temporarily quarantined during the hot summer months since poliomyelitis is most contagious during the stage when it is most likely to be called influenza. The necessity of complete rest of paralyzed limbs during the acute and subacute stages is emphasized. In the author's experience lumbar puncture seems to be harmful and he believes it should not be performed except when necessary for diagnosis. [Author's abstract.]

4. MID-BRAIN, CEREBELLUM.

Aoyama, T. TUMOR AT THE CEREBELLO-PONTILE ANGLE. [D. Zschr. f. Chir., CLXXVIII, Nos. 1, 2.]

Aoyama reviews operative methods and results granting to Cushing the first rank with only 20 per cent of mortality. The author's two cases were both operated upon on both sides according to Krause's technic. The first case died; the second recovered with quite marked improvement in every symptom. Both tumors had the typical structure of acoustic tumors. In the second case the tumor was cystic apparently because of hemorrhage and fatty degeneration.

Goldstein, K. FUNCTION OF CEREBELLUM. [Klin. Woch., July 8, 1924. J. A. M. A.]

Goldstein denies the coördinating function of the cerebellum. He believes that neither the balance nor the direction depends on it. Bárány's pastpointing reaction is practically always directed outward, which indicates the direction of primitive automatisms checked normally by the cerebral impulses which are only strengthened by the cerebellum.

Rossi, G. EFFECTS OF ABLATION OF THE CEREBELLAR CORTEX AFTER INTERRUPTION OF THE CIRCULATION. [Arch. di fisiol., 1922, XX, 191. Med. Sc.]

In drawing conclusions from the effects of unilateral ablation of superficial portions of the cerebellar cortex it is necessary to consider how far these effects are due to the circulatory interference involved in the operation. Rossi has performed a series of experiments to investigate this point. He takes as his starting-point the fact that the postural asymmetry produced by unilateral lesions of the cerebellar cortex is retained, without any alteration in character, after the animal has been killed. The asymmetry diminishes at the moment of death, and increases notably at the onset of rigor mortis; and it resembles that observed during life with such exactness that, in Rossi's laboratory, it is customary to complete the study of a cerebellar ablation with an examination of the cadaveric position. The experiments were performed on cats and dogs, and were divisible into three groups: (1) Those in which the animal before being killed had not been submitted to any operation on the nervous centers. (2) Those in which a portion of the cerebellar cortex had been excised during life. (3) Those in which a similar ablation had been carried out after the cessation of the circulation. The circulation was arrested in the following way: the carotid arteries and trachea were laid bare, and the two arteries opened, the trachea being compressed to accelerate the death of the animal. In some cases, after every sign of life had disappeared, the abdomen was rapidly opened, the diaphragm incised, and the base of the heart clamped in order to arrest every trace of the circulation. After

the operation, the animal was suspended by the lower jaw, in which position the asymmetry of the limbs was well displayed. In these operations the removal of the cerebellar cortex involved only the superficial parts of the lamellae, and consequently postural asymmetry only resulted *in vivo*, which is more readily compared with the cadaveric asymmetry than is the disorder of movement arising from deeper ablation. In the operations with arrest of the circulation the anemic condition of the parts enabled the depth of the ablation to be gauged with great precision. The experiments show that the asymmetry produced by unilateral ablation of the cortex the cerebellum is maintained, although in diminished degree, after the death of the animal. With the onset of rigor mortis it becomes increased. Asymmetry is also observed when the ablation of the cortex is performed a few minutes after the interruption of the circulation, and in this case it is qualitatively similar to that which follows ablation *in vivo* of the same part of the cortex. These experiments prove the existence of cortical cerebellar localizations independent of any lesion, primary or circulatory, of the cerebellar nuclei. Rossi suggests that the study of the cadaveric position in animals subjected during life to cerebellar lesions forms a useful complement to the analysis of the tonic changes produced by the cerebellar lesions themselves.

III. SYMBOLIC NEUROLOGY

2. EPILEPSIES.

Harryman, Ward W., and Donaldson, Sam W. RADIOLOGIC GASTRO-INTESTINAL STUDIES IN EPILEPSY. [Journal A. M. A., Sept. 8, 1923.]

The main point emphasized by these authors is that in a considerable number of epileptics there is hypermotility of the colon, and in some, hypermotility of both cecum and colon. No definite evidence of colonic stasis is found. The term "constipation" is a complaint of the patient and associated with a cathartic habit. It does not indicate colonic stasis. There are no indications for surgical procedure to relieve these patients of colonic stasis, since a true colonic stasis does not exist.

LaRue, F. G., and Thornburgh, H. T. LUMINAL IN TREATMENT OF EPILEPSY. [Ken. Med. Jl., Dec., 1923. J. A. M. A.]

LaRue and Thornburgh are very enthusiastic over the result obtained by them from the treatment of epilepsy with phenobarbital (luminal). In none of fifty-six cases treated has phenobarbital produced symptoms of hypnosis, or any other appreciable unfavorable symptoms. There has been a marked improvement in the physical condition of these patients, and in almost every instance there has also been a pronounced improvement in the temperament and disposition as well as in the psychosis, and a consequent lessening of the usual deterioration. In all but a few of the

cases there has been a marked increase in weight, some as much as 16 pounds (7 kg.) gain.

Burger, K. EPILEPTIC STATE IN LABOR AND PUERPEREUM. [Zent. f. Gyn., Feb. 16, 1924.]

Burger discusses whether epilepsy causes aggravation of the course of childbirth. He cites cases from the literature according to which the reaction of epilepsy to the pregnancy proved ambiguous.

Lennox, M. G., O'Connor, R. F., Wright, L. H. METABOLISM IN EPILEPSY. NONPROTEIN NITROGENOUS CONSTITUENTS OF BLOOD. [Arch. Neur. and Psych., Jan., 1924.]

In a large group of epileptic patients, examination of the blood for total nonprotein nitrogen, urea nitrogen, amino-acid nitrogen, uric acid and creatinin showed these constituents to be within the limits of normal.

Cobb, S. ELECTROMYOGRAPHIC STUDIES OF EXPERIMENTAL CONVULSIONS. [Brain, 1924, 47, pp. 70-75.]

The action current pictures of muscles in both "tonic" and "clonic" contraction were obtained by the production of thujone convulsions in rabbits. A string galvanometer was used, and nonpolarizable electrodes applied to the depilated skin overlying the muscle under investigation. The author finds that in both phases of the convulsion, as in voluntary movements and in reflex movements and postures, the action current is that of a muscle tetanus. In the clonic spasm the action current is discontinuous and interrupted by periods when no action current is recorded, whereas the record of the tonic spasm is continuous. [F. M. R. Walshe.]

3. PSYCHOSES.

Henderson, D. K., and Gillespie, R. D. REVIEW OF SERVICE PATIENTS IN MENTAL HOSPITAL. [Glasgow Med. Jl., Dec., 1922, XCVIII, No. 6, J. A. M. A.]

Henderson and Gillespie analyze one hundred and thirteen "service" cases of the more chronic type. The existing literature is summarized, and various points noted. The confusion and indefiniteness in diagnostic terminology in these papers is deprecated; and a plea is recorded for a uniform system of diagnostic classification. Most of the papers mentioned emphasize the inefficiency of the recruitment mental examination, and the uselessness and positive danger of passing mental defectives and obviously potential psychopaths into the army. Further, it is shown that the proportions of the various disease types among service patients has altered since the war period, and that dementia precox cases constitute, with mental defectives, by far the greater proportion of cases still under care. The etiologic factors are divided into those existing before the war and those associated with service. Of the former, insane

heredity, psychopathic predisposition, previous mental illness, constitutional inferiority (*i.e.*, mental or moral deficiency), syphilis, and excessive alcoholism, together accounted for 99 per cent of cases when full data were available. An examination of the symptomatology shows that no new type of mental disturbance has been produced by the war, but that certain psychoses (*viz.*, dementia precox) which in civil life are usually chronically progressive, appeared in an acute, recoverable form. It is evident that the majority of the cases under consideration would eventually have entered mental hospitals even had it not been for the war strain.

Mayendorf, N. V. HALLUCINATORY STATES OF THE PREDISPOSED. [Arch. f. Psych. u. Nervkr., Vol. LXVI, Nos. 3, 4.]

Mayendorf describes acute hallucinatory states which he believes represent a periodic outbreak of a congenital disposition to hallucination which exists in connection with the intellectual condition designated degeneration. The hallucinatory condition appears with temporary hallucinations unusually strong in emotional tone with a tendency to acts of violence and to suicide. It appears suddenly or after a longer hypochondriacal prodromal stage and it may last for weeks or months or only for a brief period. Sensory illusions recede, but never completely disappear so that there is never recovery. Therapy can be directed only to quieting symptoms and guarding the patient. The hallucinatory phase can not be attributed to the emotion. The disturbance is seen oftener in women than in men and begins usually between the ages of twenty and thirty years. The patients come from neuropathic families or from eccentric or otherwise psychically abnormal families, but show no trace of feeble-mindedness. The disturbance is designated idiopathic hallucinosis.

Raphael, T., and Potter, F. C. BLOOD FRAGILITY STUDIES IN CERTAIN PSYCHOPATHIC STATES. [American Journal of Psychiatry, II, No. 3, p. 409.]

In this study there was utilized a series comprising ten normal controls and two hundred and twenty-eight psychopathic cases of both sexes, including dementia precox, manic-depressive insanity, psychoneurosis, general paralysis, epilepsy and mental deficiency, all of which as far as could be detected by gross examination were apparently negative, clinically, from other standpoints. The technic employed was that suggested by Greenthal and O'Donnell, an improvement over the original erythrocyte fragility technic as devised by Butler. Analysis of the tabulated results indicated definite deviation from the fragility form in each of the psychotic groups, slight to moderate in degree and in both directions. This deviation was present in 50.6 per cent of the cases of dementia precox, 37.8 per cent showing an apparent decrease in red cell resistance, and 12.6 per cent an increase. The manic-

depressive cases showed, in the depressed phase, a total deviation of 28.4 per cent, equally divided in point of positive and negative variation, and in the manic phase, a total deviation of 38 per cent, 23.8 per cent showing increased fragility and 14.2 per cent showing a decrease. It is conceivable, particularly in the dementia precox and manic-depressive groups, that the fragility change may represent a secondary or reflected effect, dependent in some way upon basal metabolic or toxic disturbance, a conception borne out by previous reports of other blood changes.

Schrijver, D. A TOE REFLEX AND ITS SIGNIFICANCE IN THE PSYCHOSES. [Zschr. f. d. ges. Neur. u. Psych., Vol. LXXIX.]

Schrijver reports a toe reflex which he found first in two catatonics and then with more accurate examination in a large number of patients. It seems to be especially frequent with dementia precox patients. It consists of a plantar flexion of all the toes upon tapping of the medial tibial surface, of the patellar ligament and of the upper thigh. It is apparently not a pyramidal symptom, but may be due to processes like swelling of the brain. Other writers have made similar observations.

Sjöbring, H. PSYCHIC ENERGY AND MENTAL INSUFFICIENCY. [Ups. Läk. För., XXVIII, Nos. 3-4.]

This careful study treats of the significance of the concept of energy as applied to psychical states. The human being as a transformer and deliverer of energy is accepted and disease processes thought of in terms of faulty mechanisms advocated. The available knowledge concerning these faulty energy distributions in terms of Freud's libido concept is not yet grasped.

Smith, J. C. FUNCTIONAL PSYCHOSES IN THE ELDERLY. [Hospitalstidende, Vol. LXV, No. 30, p. 513.]

This extremely important and much neglected problem is here dealt with on a basis of three cases which showed symptoms at first thought of as of somatic origin. Later recovery caused a revision of the terminology.

Stiefler, Georg. PSYCHOSES AND NEUROSES IN THE ARMY IN THE FIELD. [Jahrb. f. Psych. u. Neur., Vols. XXXVII-XXXIX.]

The author makes a very full and interesting report of 554 cases of the psychoses and neuroses observed during a service of four years in the war. He makes comparison throughout of his findings with those of other authors. His own experience through service with the troops, during siege and later in field hospitals, one hospital itself being under attack during the siege, gave opportunity to observe both his patients and other men under peculiarly trying conditions.

He reckons among the patients whose disorders arose from internal causes, that is from hereditary, familial and personal disposition, those with congenital mental defect as 10.5 per cent, with schizophrenia 11 per

cent, with manic-depressive psychosis 6.3 per cent, chronic delusional formation 0.7 per cent. There was observed on the whole no increase in frequency nor any peculiarity in the course of the disturbance to distinguish it from the same condition in times of peace, although in individual cases the experiences of war worked for better or for worse. The mental attitude toward war on the part of these patients was that often of a fearlessness based not on ethics or reason but in a childish lack of appreciation of danger and a lowered feeling tone. Where in the manic-depressive patients depression prevailed the absorption in the patient's own delusional ideas excluded interest in the serious events about them. Cases of chronic delusional formation were very rare.

Epileptic psychic disturbances constituted 8 per cent of the cases. In almost half of them these were post- rather than pre-epileptic psychoses. There were observed clinically periodic affective alterations of depressive and maniacal character, many forms of twilight states, simple dreamlike behavior, delirious confusion with sensory illusions, stuporous states, well formed deliria, compulsive wandering in the twilight states. The neurological material was gathered from over 200 cases of epilepsy, almost exclusively from chronic "genuine" epilepsy. During the siege there were 181 epileptics in the neurologic division, 155 of them with convulsive attacks. The period of more active fighting together with insufficient nourishment brought an increase in the number of these patients. During the attack upon the hospital a series of convulsions appeared in the chronic epileptic cases with improvement again even without medication in the quieter periods. Ninety per cent of the cases were chronic before the war, less than one-eighth had attacks for the first time during the war while in most of these there was hereditary familial disposition. Great caution had to be exercised in making a diagnosis of epilepsy on the ground of the psychic symptoms which were so varied. In the cases referred from the front to the rear hospitals the author found only a relatively small number of cases of true epilepsy among many suspects, while at the place of siege the converse was true. Hysteria could be detected usually by the response to suggestive treatment of various kinds as well as by the finger-thumb reflex, which is absent in the true epileptic attack.

Alcoholic psychoses constituted about 6 per cent of the cases observed. They were much more frequent earlier in the war than later when alcohol had been limited or prohibited. It was especially noted that in the Russian troops who were carrying on the siege there was no acute alcoholic psychosis nor outspoken chronic alcoholism. Stiefler refers to the reports of others as to the great falling off in the number of alcoholic mental disturbances throughout Germany 1913-1917.

General paresis was present in 7.2 per cent of the cases, most frequently in the form of dementia with marked affective loss showing itself in great indifference to war experiences and an apparent bravery resulting

from this attitude. Only initial cases or those representing a far-reaching remission showed any effect of war experiences. Stiefler agrees with others that war neither hastens the incubation period nor the course of general paresis, nor does it increase the frequency nor cause greater mortality although some influence upon individual cases could not be denied. Naturally the increase of syphilis will increase the later toll of general paresis.

Among the infection psychoses (7.6 per cent) typhoid held first place as cause though the mental disturbance was usually only that of the delirium and twilight condition accompanying the early febrile stage. Rarely there was a psychotic condition, Korsakow's forms, in the convalescent period. A number of cases of typhus showed a stuporous condition. Rarely there was delirious confusion with cholera. Though dysentery was frequent no psychoses accompanied it. The author believes that when an infectious disease favorably influences an already existing mental disease this is due to the fever, not the infection. He refers to the experiences of v. Wagner-Jauregg in treating general paresis with tuberculin and with the inoculation of malarial blood.

Stiefler believes that in the field of the psychopathic constitution, with its wide variety of manifestations estimated at 11.9 per cent, it can be decided only individually whether or not the psychopath should be taken into the service. One must consider both the variety and degree of clinical manifestation and the kind of service to be required. The condition at the front with its discipline may be of actual service, for example, to the moral defective. He reports only seven cases, 1.2 per cent, of acute hallucinatory psychoses characterized by delusions, hallucinations of hearing interpreted as hostile, state of anxiety but with good orientation as to time and place and general clear, well ordered relation on the part of the patient.

Nervous and psychotic conditions due to exhaustion play a very large part, may indeed be common to all soldiers who remain long in the trenches. It shows itself in weariness, slackness in bearing, need of rest, dulled emotional condition. The limbs assume a certain position in sleep which they retain almost grotesquely. The ease with which such patients submit to anesthesia under surgical treatment suggests brain exhaustion. Acute nervous exhaustion is a purely neurasthenic condition due to physical overexertion, the inherited constitution playing an unimportant rôle. The clinical evidences are rapid exhaustion, inability to concentrate, slowing of physical and mental movement, loss of interest even to depression. There are also increased irritability and excitability, oversensitiveness to optic and acoustic impressions, lability of emotion and tendency to tears, inner restlessness, sleeplessness with great need for sleep, often fine vibratory trembling of the hands, acceleration of heart activity, lability of pulse. Often psychogenic symptoms are mixed with the purely neurasthenic ones, anxiety added to the depression, tendency to

illusion even to genuine sensory hallucinations. All likelihood of these cases being infectious psychoses was carefully eliminated. Neurasthenia was found to prevail among the feminine population particularly with older women who had been compelled to change their mode of life and take up unaccustomed work. The lack of nourishment was also a factor here.

There were cases of true psychic disorder due to exhaustion, also due to undernourishment, therefore above all famine psychoses. The somatic symptoms were sometimes very severe, great loss of flesh, general muscular atrophy, pale, cool skin, often yellowish livid color of the face, greater or less insufficiency of the heart which sometimes resulted in sudden *adynamia cordis*. The writer does not claim for these cases that they represent a clinical entity, but rather various symptomatic forms as seen in other disorders. They all represent psychoses without impairment of intelligence and have in common certain characteristics such as clouding of consciousness, disorientation, gross disturbances in understanding and in elaboration of external impressions, slowness and incoherence in ideation. The question remains whether there is here direct brain injury or some other somatic change responsible for the psychic symptoms.

Both psychic and somatic disturbances, the writer reminds us, arise from a psychogenic origin. They arise directly from affect or from affectively toned ideas. The psychogenic mental disturbances divide themselves clinically into psychogenic depression and condition of anxiety and psychogenic twilight states. The first group shows a range from longing for home to depressive moods with loss of courage, apathy, despair. In the somatic field there are neurasthenia, rarely hysterical symptoms, an excited condition of fear where terrifying experiences have been in part the cause of the condition. The prognosis is good and depends essentially upon the external conditions. Among the twilight states which are transitory in character there appeared clouding of consciousness and more or less complete amnesia. Usually some terrifying experience had occurred, in one-half of the cases acting upon an already nervous constitution. There were often hysterical physical symptoms. The duration was anywhere from a few hours to a number of months. The prognosis was good.

The writer believes that there is no need to speak of a definite war psychosis. The frequency of the psychogenic neuroses varied with the location of the point of observation. They formed only ten per cent of the cases seen at the place of siege. In some instances such cases already have a nervous disposition. Most of the cases are of hysteria with mutism, deaf mutism, pseudocoma, pseudospastic paralysis, etc. Genuine hysteric attacks were rare at the front. There is a hypochondriac hysteria under which it is easy to make a false diagnosis. There is also difficulty of distinguishing unconscious from conscious simulation.

though the author believes that pure simulation was rare while exaggeration was frequent, although simulation was more frequently met with at the rear.

He discusses under the disputed question of "shell shock" neuroses whether there are morphologic changes in the nervous system or whether merely strong affects are roused or affectively toned ideas, which awaken wishes and forms of desire which cause and fix the neurosis. The question of importance here is not, he believes, whether one is nervous, but how. Some healthy persons, some psychopathic are fitted for war, others of both classes are not. The neuropathic disposition as a cause for these war neuroses is outdistanced by the nervous susceptibility caused by the war to which perhaps every one would be subject to some extent in time. He finds the symptomatology of "shell shock" unified, but not of a fixed character. The characteristics which speak for the psychogenic origin of these disorders are that they are much more rare among the troops than in the hinterland, they are rare in general among the wounded, not present at all among the severely wounded. Furthermore the same symptoms are seen after other trying experiences. Also they are seldom seen in combination with commotional organic disturbances of the nervous system. External psychic influences have great effect bringing about perhaps a spontaneous cure. These disorders are seldom found among prisoners whose will toward health is an aid to being returned to the homeland. Finally there is the favorable effect of suggestive therapy upon these cases. [Author's abstract.]

Kastan, M. ABDERHALDEN REACTION IN PSYCHIATRY AND NEUROLOGY IN THE PRESENT STATE OF KNOWLEDGE. [Arch. f. Psych. u. Nervkr., Vol. LXVI, Nos. 3, 4.]

No sure conclusions can be drawn from the Abderhalden reaction chiefly because it is not only the defect psychoses which show deterioration of the brain. There are still difficulties in the technic but the failure of reaction is largely due to the peculiar capacity of the serum for absorbing material from the organ. Other factors also may disturb the colloidal equilibrium of the serum.

4. MEDICO-LEGAL; SOCIAL.

Glueck, B. PSYCHIATRY AND DELINQUENCY. [Ed., J. A. M. A., 1923.]

"What have psychiatry and psychology to offer as aids in the field of delinquency?" asks Dr. Bernard Glueck in a very interesting and illuminating article on the psychiatric attitude in a recent number of the *Survey*. He goes on to say: "If by the field of delinquency is meant the traditional enterprise for the administration of the law, I am afraid these sciences can be of very little aid. Psychology, as the

science of the mind and human behavior, and psychiatry, which literally means mindhealing, are tools for different purposes than those reflected in the processes of the criminal law. If we are honest with ourselves, we must say that these processes have refused in the past to have anything to do with questions of understanding and healing. The criminal problem is not kept alive by the occasional offense of a first offender, but by an ever increasing element in our population who seem to have accepted criminal behavior as a life career. It is these individuals who may have had repeated contact with the established machinery of the law who attest to the utter failure of these processes to affect materially the problem of crime. But if by the field of delinquency we mean those social service enterprises which have been made possible in spite of certain aspects of criminal procedure, these sciences of human behavior can make themselves felt very decidedly in connection with the administration of the problem of crime. Delinquency, when viewed in an impartial and unbiased fashion, is quite understandable as a problem in human behavior. As such, the workers in this field can at once avail themselves of a fairly well organized and dependable technic for the understanding and direction of human behavior."

Doctor Glueck proceeds to describe in brief this technic. Perhaps the most important element is the psychological and psychiatric attitude toward a problem. Only the inexperienced physician or social worker ever indulges in the holier than thou attitude. Intimate contact with the problems of life and increasing self-knowledge are bound to remove the obstacles to cultivating a proper conception of the understanding and service involved. Another thing to be cultivated is the scientific conviction that "nothing in human behavior happens quite fortuitously and out of a clear sky; that the only way in which one can discover and evaluate causes is to approach a question free from preconceptions." A delinquent act has usually multiple causes. Psychology and psychiatry, more than any other approach to the problem, aim to base conclusions upon an evaluation of all the biological, psychological, social, economic and pathological factors in the case.

Another question as to proper attitude concerns the scope of psychiatry. Once, and sometimes now, the function of this science, in regard to criminology was limited to a statement as to whether or not the delinquent was feebleminded or insane—in other words, was he responsible for his crime? "Now, in actual practice, psychiatry has come to define its task to be that of understanding and treatment of human behavior. The issues of disease or defectiveness are only some of the issues it meets, and as soon as such issues become established in connection with a problem of delinquency, they become problems in medicine and should be dealt with mainly, if not exclusively, from a medical standpoint."

The true scope of psychiatry, then, is to be found in the kinds of facts it deals with. These are, the writer goes on to say, first, the elements of human nature relating to man's inherited dispositions to act on and reflecting the history of his descent—in other words, his "biologic destiny"; second, the "acquired or learned equipment of man," enabling him to act and adapt himself to the conditions of life automatically or reflexly. The nature of this acquired equipment is determined, indirectly at least, by innate dispositions, leading their possessor to shun or to seek out certain life experiences. The psychiatrist must recognize the close and important relationship of these factors. "Without such a conception, it would be difficult to account for the real differences in traits and life pursuits between races and peoples, as well as between certain pathologically disposed individuals, like the true epileptic, for instance, and the normal human being."

The next subject with which psychiatry concerns itself is the true evaluation of those circumstances of life common to all individuals, such as the problem of emancipation from the home, of proper self-esteem, of sex, and of various other critical times in the life and development of every person, requiring more than the usual adaptive capacity, such as the acute periods of puberty and adolescence, of aging and decline, of grief and bereavement. Psychiatry must study also the actual failures in adjustment and the definite factors involved, such as heredity, injury, infection, exhaustion, emotional insults, bad habits, and other conditions.

"Finally, psychiatry is concerned with the technic of human adjustment and with those positive principles of a hygiene of the mind that might be utilized as preventives of failures in human adaptation and as means towards a more effective conscious control of the human machine. . . . If psychiatry is not making itself more effective in connection with the problem of crime, it is due both to limited opportunity and imperfect technic. But it knows its objectives, and it is up to those who believe in the introduction of a social service point of view into the field of delinquency to see to it that this point of view embraces the aims and technic of psychiatry."

Christiansen, V. TRAUMATIC INJURY OF NERVOUS SYSTEM. [Hyg., LXXXIV, No. 43. J. A. M. A.]

Christiansen protests against the Danish legislation which refuses to consider a causal connection between accidents and affections which develop more than three years later. He describes a number of instructive cases in which the connection seemed to be beyond question although the interval had been nine, ten, up to twenty-one years. He emphasizes one clinical picture in particular, severe atrophy and sensory disturbances in the ulnar nerve domain with a deforming arthritis in the elbow and a history of dislocation of the elbow ten, twenty years before. The function of the elbow may be only slightly impaired by the bone affection; in one case merely the last five degrees for complete extension were hampered,

but roentgenoscopy confirmed the bone lesion. He describes other cases in which a brain cyst developed at the site of a trauma of the head twenty or thirty years before. The interval was sixteen years in one case, and the man succumbed to embolism after the operation on the cyst. Christiansen regards the man's heirs as entitled to compensation as there had been more or less indications of irritation of the cortex during this long interval, as likewise in another case in which a fibrosarcoma was removed from the site of trauma ten years before. This man recovered full earning capacity two years after the operation. Instances of tardy traumatic epilepsy are cited which reproduce the various stages of genuine epilepsy. He describes in addition a case of trauma to the back of the head which was followed at once by unconsciousness and drowsiness. The third day there was total oculomotor paralysis. The somnolency persisted for two or three weeks but the condition was completely normal once more by the end of the month. The young man had been knocked down by a motorcycle, but the attending physician diagnosed epidemic encephalitis from the tendency to somnolency and the ptosis, and the claim for accident indemnity was rejected at first.

Legge, et al. DISCUSSION ON THE PATHOLOGICAL CHANGES PRODUCED IN SUBJECTS RENDERED UNCONSCIOUS BY ELECTRIC SHOCK. [Proc. Roy. Soc. Med., XV (Sect. Elect.-Therap.), 45. Med. Sc.]

Legge said that they wanted to know whether the instructions for the treatment of persons suffering from electric shock issued under the Factory and Workshop Act were sufficient, in view of the knowledge acquired since the work of Prévost and Batelli in 1899. In 1918 Professor Boruttau attacked the apparent-death theory of Jellinek, using the statistics from the German factory inspectors' reports, which showed that artificial respiration was unsuccessful. British statistics support this. Ram referred to the increased voltage allowed by the Board of Trade since the early days. Nearly all accidents were due to touching one conductor when standing on the ground. He had noticed that a severe shock followed by a severe fall often did not produce death, and suggested that a counter mechanical shock might be of great use. The area of contact was not important. Levy said he thought there was no doubt that the commonest cause of death was fibrillation of the ventricles; the time for this to come on varied. He said that most observers agreed that currents of 1,200 volts and over, if passed from head to foot, did not affect the heart, but did so when passed through the thorax. The effect of shocks from a condenser was not cumulative, since a single shock would cause fibrillation if passed in at the exact moment of the cessation of the refractory period. He referred to the continuance of respirations after the heart had stopped beating. He believed spontaneous recovery in man was not uncommon but could not occur later than about two minutes after the onset of fibrillation. Massage of the heart was a certain means of restoring its action, but must be carried out within five

minutes. If respiration were paralyzed without the heart being affected then prolonged artificial respiration was indicated; as both heart and respiration might be affected, he advised artificial respiration on the remote chance of spontaneous recovery of the heart. He also spoke of disengaging a person from a live wire with the foot and not the hand. Spilsbury said it was nearly always possible to determine the points of entry and exit of the current postmortem. He referred to the usual postmortem findings and gave suggestions as to the cause of death. Mac-William said he had found two modes of immediate death: (1) arrest of respiration from paralysis while the heart continued to beat; (2) fibrillation of the ventricles. He referred to the relative frequency of these two types of death. He also advised artificial respiration in all cases and stated that massage of the heart was also of great use, especially if accompanied by the intravenous injection of drugs, several of which he mentioned, with the dose to be employed.

Meyer, E. INCREASE IN DRUNKENNESS AND ALCOHOL ADDICTIONS. [Crin. Méd., XXXIX, No. 711. J. A. M. A.]

These figures show the rapid increase in alcoholism since 1918 in Germany. The percentage of cases of alcoholism in the Königsberg psychiatric clinic in 1921 and 1922 (12.58 per cent men and 2.18 per cent women) almost reached the prewar level (16.75 men and 2.26 women). On a recent Saturday evening, between 8 and 10 o'clock, he met between thirty and forty drunken persons on the streets of Königsberg. He recommends prohibition of the manufacture of strong liquors and strong beers as a start for general prohibition.

Loofs, F. A. CLINICO-CHEMICAL CONTROL OF MORPHINISM. [Zschr. f. d. ges. Neur. u. Psych., Vol. LXXIX.]

The author describes in detail the process by which he believes that clinico-chemical control over morphinism can be exercised and without knowledge of the person concerned. He was able to detect morphin regularly in the urine of eight individuals who had had morphin for some time even when only 0.015 had been administered. He suggests that the morphin invading the cholin becomes bound with the lecithin molecule. The more cholin is replaced by morphin the less the effective capacity of the morphin. The cause of the habit is to be found here.

PHYSICIANS' FINDING OF INSANITY EVIDENCE OF PROBABLE CAUSE FOR PRIOR BELIEF. [Bode v. Schmoldt et al. (Wis.), 187 N. W. R. 648.]

The Supreme Court of Wisconsin, in reversing a judgment for damages obtained by the plaintiff, and doing it with instructions that the complaint be dismissed, says that the action was for malicious prosecution, on account of the defendants having made an application to the judge of the county court for a judicial inquiry as to the plaintiff's mental condition. A recovery of damages was precluded, if the defendants established

their defense that there was probable cause to believe the plaintiff insane. The physicians appointed in response to the defendant's application found that the plaintiff was insane. Should the ordinary layman be held to respond in damages for instituting an inquiry into one's sanity because there was no reasonable ground to justify the belief of insanity, when two reputable physicians appointed by the court, constituting the agency provided by law for the ascertainment of one's mental condition, determine that the suspect is in fact insane? There would seem to be an incongruity in such a rule. It would make the institution of such proceedings a hazardous undertaking and would tend to restrain the initiation of such proceedings on the part of citizens which the welfare of society often demands should be instituted. If the advice of an attorney in the ordinary civil or criminal prosecution is conclusive evidence of the existence of reasonable cause, why should not the finding of physicians appointed in insanity proceedings to ascertain his mental condition, that the subject is insane, conclusively establish the existence of reasonable cause for the institution of the proceedings? Physicians so appointed are the agency created by law for the ascertainment of the mental condition of the alleged *non compos*. When they have found the subject insane, why should the existence of reasonable cause to believe him insane be longer an open question? The law regards it as a closed question so far as the future course of the proceedings is concerned. If the physicians find the subject sane, that ends the proceedings; if insane, there is a further inquiry. If this finding justifies a further judicial inquiry, why should it not also be held to have justified the filing of the petition, and why should those filing the petition be held responsible for the consequences of the further proceedings? This court holds that, when physicians appointed by the (county) court to inquire into the sanity of a suspected *non compos* find and report him insane, such finding constitutes conclusive evidence of the existence of reasonable grounds justifying the filing of the application and the institution of the inquiry, unless the inquiry can be impeached for fraud or bad faith on the part of the physicians, or for collusion with the petitioners, or for other conduct, which deprives their conclusion of the character of a *bona fide* professional determination. It was true that in this instance, the physicians interviewed the neighbors, and it was possible that their conclusion was based in part on the result of the interview; but the Wisconsin statute expressly enjoined them to satisfy themselves as to the person's mental condition by personal examination and inquiry; and the court sees no reason for denying to the report the conclusive effect which the court holds should be ascribed to a *bona fide* professional determination on the question of the suspected person's mental condition. [J. A. M. A.]

BOOK REVIEWS

Sergent, E., Ribadeau-Dumas, L., Babonneix, C. TRAITÉ DE PATHOLOGIE MÉDICALE. Vol. VI. Tome II. NEUROLOGIE: 2d Edition. [A. Maloine et Fils, Paris.]

Three years ago the first edition of this large Traité appeared with two volumes on neurology. These neurological volumes appear in rewritten and in many instances much enlarged form. Certain of the chapters are practically reprints of the former edition, yet the number of additions entitle the works to be described as in reality a new edition. Froment's chapter on Peripheral Nerve Involvements is particularly full and thoroughly revised. Lhermitte's section on Cerebral Hemorrhage is good. Crouzon's discussion on Heredodegenerations follows his well-known monograph. Vincent's chapter on Hysteria still remains in the Charcot era with inclusion of Babinski's crude ideas of suggestion. Roussy and Lhermitte contribute an excellent résumé of the neurology of war. The work is quite unsystematic but the various essays are for the most part of high order.

Falta, Wilhelm. ENDOCRINE DISEASES, INCLUDING THEIR DIAGNOSIS AND TREATMENT. Translated and Edited by MILTON K. MEYERS, M.D. Third Edition. [P. Blakiston's Son and Co., Philadelphia.]

Falta's work was one of the first authoritative works on the clinical aspects of endocrinology. His Viennese colleague, Biedl, elaborated the many theoretical aspects connected with hormone action but Falta kept to the clinical side. In a sense the two works supplement each other and together constitute a veritable encyclopedia of endocrinology.

With the third edition the work has assumed a much more balanced proportion than were the earlier editions; furthermore the American editor, Dr. Meyers, has woven into the book many issues of much importance and value, still further adding strength and coherency to the work.

One can still maintain, as was stated for the earlier editions, here is a work of sound value to the clinician.

Myerson, Abraham. THE INHERITANCE OF MENTAL DISEASES. [Williams & Wilkins Company, Baltimore, 1925.]

It augurs well for medical progress that a book like this should be one of the first of the new quarter century to appear from the press. The author comes boldly forward to strike telling blows against concepts not only obstinately held but widely supported among scientists on what the present writer considers insufficient

grounds. He, as it were, takes his opponents candidly by the hand at the start, frankly apologizes if too severe, admits his own hypotheses to be only possibilities subject to the functional test of scientific research, and then proceeds to the exposure of the darkness and confusion into which a number of widely accepted abstractions have led scientists and laymen alike. Psychiatry itself he redefines, divorcing it from the narrow conception that separates mental diseases from the disorders of the body. This leads directly into the still greater breaking up of the "obfuscating" idea that mental diseases in any way form units in themselves. Out of such a misconceived homogeneity, crystallized at its worst in the meaningless though too convenient notion of "insanity," Myerson points out the heterogeneity which must be followed up to discover true disease entities—as far as these exist—or the general disturbed reactions to life which are hardly specific diseases. In all, manifold symptoms accompany each other in mental and bodily spheres alike. Upon such a more exact and definite basis, unattained as yet, the question of heredity, he believes, is lifted out of the abstraction which now surrounds that term when applied to mental diseases. His contention is that the latter do not represent "really hereditary" characters, in the sense that stature and blue eyes are hereditary characters," but rather "diseases, caused by unknown agents whose effects persist over two or more generations and from which a stock may either die or recover." He adduces for this hypothesis of germ-plasm injury, or "blastophoria," much clinical material of his own, and points out in detail much fallacy in the method of collecting and utilizing data by those who, as he conceives, misapply the Mendelian theory. They uphold a "polymorphism" by which a neuropathic constitution is made responsible for manifold disease manifestations. They drag into its net much that is irrelevant to the problem at hand and better suited to show the wide variety of functional manifestation in the race at large than to be counted as indicative of the presence of mental disease. The book is well worthy of study by anyone interested in the subject of heredity in this field, anyone willing to be disabused of hindering conceptions. It provokes thought and challenges either agreement or disagreement upon the one scientific ground of actual investigation.

Delacroix, Henri. LE LANGAGE ET LA PENSÉE. 1 vol., pp. 602. [Alcan, Paris, 1924.]

We cannot too forcibly draw the attention of all those who occupy themselves with the problem of aphasia to the very great importance of this work. The author, in fact, has taken fully into account the all too well-known inadequacy of a single point of view in the psychological consideration of the study of language. For him the nature of man is threefold—physiologic, psychologic, and social—and language, *a specifically human phenomenon*, should be regarded from these three points of view. In the very first place—and this has been too much ignored in France—there is no psychology of speech without having recourse to linguistics. The author therefore has been able to point

out, in a remarkable manner and revealing great knowledge of the subject, much that has been discovered through this science and most particularly from the works of Saussure and Meillet.

It would not be possible in a brief analysis to reproduce all that this book contains of interest to the neurologist. Therefore we will confine ourselves to the more general results of the author's work.

The complexity of the psychologic mechanisms which constitute speech is such that it is difficult to make a beginning at their discovery. As the author has very well said, the verbal sign is not simply a sound, a movement, or a figure which takes the place of something absent and produces its effects: its essential character is the power which it has of combining with other signs of the same kind and of becoming modified in order to operate upon the relations of the things signified and for the sake of validating the assertions in regard to them.

A system of words is language only if the mind is able to perceive successively each unit; but each unit has meaning only in the midst of a mental and linguistic system, and a series of words which pass before the mind become speech only through the rank and rôle assigned each unit; that is to say, in the measure in which the mind converts the succession into simultaneousness and the separate series *into a mental system*. The verbal gesture becomes a word solely under the conditions of a phrase, therefore of the judgment. But if the *symbolic thought* (taking this word in the sense of Head) coincides with the thought directly, one entire portion of speech is the function of the affective life and of the social life. Language is the expression of thought upon objects, depending upon the movements of the affectivity and the orientations of society: the conjunction of the mental sign with the affective-social sign.

Particularly interesting is that portion of the work which treats of the pathology of speech (verbal hallucinations and aphasia). As regards aphasia, one will find a very exact setting forth of the recent ideas of Henry Head in the four forms which he distinguishes, verbal, nominal, syntactic, and semantic aphasia. Delacroix considers that the work of Head constitutes the greatest advance of latter years in the domain of pathology. Without in the least disputing this opinion, we should like to have seen the work of Kussmaul, who was a precursor of Head, and the still more important work of von Monakow submitted to discussion.

On the other hand, the author takes account of the contribution of Hughlings Jackson, which has been made known in France, and that of the lamented Arnold Pick, whose study of the process of the formation of the phrase is presented in detail.

In summarizing, this book puts us on guard in each page against every tendency to reduce to a scheme, as it brings to light the complexity of the phenomena of speech, absolutely incomprehensible through the simplistic notion of current psychology. Nature mocks at our scholastic divisions; and one could make a series of sections throughout the centuries (a task to which we by no means deny an

interest), but the problem of aphasia will be in no wise comprehended if we forget that language is a phenomenon of a triple nature.

M. Delacroix demonstrates this with a mastership the equal of which we do not know in any tongue. R. MOURGUE (Nîmes).

Laignel-Lavastine. *PATHOLOGIE DU SYMPATHIQUE.* 1 vol. in 8° de 1080 p. Préface du Professor H. Roger. [Alcan, Paris, 1924.]

The pathology of the sympathetic, by which word should be understood the organo-vegetative system in its entirety, has not yet received a complete statement in the French language. M. Laignel-Lavastine here gives us the results of more than twenty years of study in what is indeed a genuine review of all the internal pathology, to which we assent inasmuch as there is not a single organ of the body which is not dependent upon the vegetative nervous system. In other words, the clinical syndromes, tegumentary, muscular, those of the neuraxis, the circulatory, respiratory, digestive, urinary, genital, endocrinous, etc., occupy a great part of the vast work.

For the author, however, it would not be possible to distinguish the pathology from the anatomo-physiology, which occupies the first and the second part and which is treated with a great wealth of detail. Laignel-Lavastine was a pupil of the physiologist François Franck and it is not to be wondered at if he relies a good deal upon these rather antiquated works. In this present subject, it is a matter of regret that we do not find the question carried over to the vegetative centers at the base of the brain, as has been the case in the works of the school of L. R. Muller and of Kraus (the Charité of Berlin), a general review of which Spiegel has given in this JOURNAL. Certain problems, such as those of the function of the suprarenals, have been very well set forth, while the pathological anatomy includes the presentation of a large number of personal works.

We should mention as of special interest the author's criticism of the conceptions of Eppinger and Hess relative to vagotonia and sympathicotonia and the eight rules for pharmacologic study which he substitutes for them: rule of dosage, of amphotropism, of the previous state, of the local electivity of reaction, of balance, of lowering the threshold, of diaschisis, of the liberation of function.

The conclusions of this large work are given by the author in the form of three theses:

I. *Anatomic thesis.* The lesions of the sympathetic conform to the laws of general pathology.

II. *Physiologic thesis.* There exists a simple agreement between the anatomic location of a sympathetic irritative or destructive lesion and the corresponding experimental sympathetic syndrome.

III. *Clinical thesis.* Certain clinical entities, already individualized, due to disorders of the sympathetic established by pathological anatomy (anatomic criterion) or by experimentation (physiologic criterion). The sympathetic factor made evident by clinical analysis can sometimes be exactly located in the ortho- or the para-sympathetic,

but often the complexity of the syndrome would lead us to the modest assumption of a *holosympathetic disequilibrium*: hyper-, hypo-, or dys-sympathy.

By orthosympathetic the author means the thoracocervical, and by holosympathetic the whole of the vegetative system (sympathetic and parasympathetic in Langley's sense).

The work, which unfortunately has no index, ends with a copious systematic bibliography, which comprises no fewer than 239 pages. It is illustrated by 105 figures. R. MOURGUE (Nîmes).

Freud, S. ZUR EINFÜHRUNG DES NARZISSMUS. [Internat. Psch. Verlag, Leipzig, Wien, Zurich.]

Narcissism as a term was taken over by Havelock Ellis to signify just what the ancient Greek myth meant to convey, those trends in human behavior that were devoted to self-love, resulting in partial or complete rejection of the female. Näcke, as Freud here points out, gave the term a more definite connotation and psychoanalytic study by Sadger and others showed how large a part it played in overt homosexuality. Further study of the unconscious showed still further how widespread it might be as a physiological as well as a pathological component of the libido striving, the extreme instances of which are quite apparent in schizophrenia where Jung's conception of introversion of the libido throws an illuminating beam. Further study of the child life and the psyche of primitive peoples relates this focalization of the libido, which the more physiologically is directed upon objects in the external world, upon the ego, resulting in the overvaluation of the wish element in their thinking (autistic thinking of Bleuler) leads to the belief in the "all powerfulness of thought," constructs fairy tales and magic, underlies many superstitions in religion, medicine, history, and politics, and constitutes the kernel of that ineradicable itch for the supernatural which is at the nucleus of spiritualism, psychical research, ectoplasm, metapsychics of Richet, and the like.

This delightful essay of Freud, originally published in 1914 in the "Jahrbuch," would not offer anything particularly new, he tells us, but would assemble the various issues and present them in a unified manner so that the various situations which are molded in part by this libido activity might be the more readily recognized and made amenable for psychological investigation.

Freud, Sigmund. OBRAS COMPLETAS. TRADUCCION DE LUIS LOPEZ BALLESTEROS Y DE TORRES. [Biblioteca Nueva, Madrid.]

A definitive edition of the complete works of Freud has been projected of which the present edition translated into Spanish is the first to appear. Two volumes have appeared in the English edition to date, from the Hogarth Press, and some three or four have appeared in the German edition from the Internationale Psychoanalytische Verlag.

The present edition in Spanish already has eight volumes to its

credit. Vol. I contains the Psychopathology of Every Day Life; Vol. II, Contributions to the Sexual Theory, The Five Conferences at Clark University, Introduction to the Study of Dreams and Beyond the Pleasure Principle; Vol. III, Wit and the Unconscious, and Jensen's *Grävida*; Vols. IV and V, General Introduction to Psychoanalysis: General Theories of the Neuroses; Vol. IV contains an excellent portrait; Vols. VI and VII, The Interpretation of Dreams, and Vol. VIII, Totem and Taboo, and Leonardo da Vinci. Vol. IX is announced as Mass Psychology and the Ego.

Since the American physician for some years has been emerging from a one language provincialism, and in more recent years has more and more been in touch with Spanish, the present edition will make an excellent course in language as well as presenting Freud's ideas in another language. Since most excellent English translations of nearly all of Freud's works are available as ponies here is an excellent opportunity to acquire a linguistic as well as psychoanalytic facility.

Osborn, Henry Fairfield. IMPRESSIONS OF GREAT NATURALISTS. [Chas. Scribner's Sons, New York. \$2.50.]

Professor Osborn's writings are always a treat. Not only do they contain tried and true biological information, but it is presented in a manner delightful, humanly sympathetic, and of pleasing proportions. These biographical and critical essays present him at his best, for with the interesting facts are interwoven most fascinating glimpses of the personalities of and habits not only of the author himself, but of the students of natural history of whom he writes. To have such impressions of the makers of biological science preserved for us is a distinct acquisition.

The Germans have done more in this line of hero worship for their scientific lights than any other people. Perhaps an undue modesty has inhibited our following so worthy an example, and Professor Osborn's contribution deserves the highest commendation.

Here are to be found most illuminating sketches of the lives, attainments, and offerings of Wallace, Darwin, Huxley, Balfour, Pasteur, Leidy, Cope, Muir, Burroughs, Roosevelt, Bryce, and Butler, six Englishmen and six Americans.

We heartily commend these essays to our readers.

Freud, Sigmund. ZEITGEMÄSSES UEBER KRIEG UND TOD. [Internat. Psa. Verlag, Vienna, 1924.]

Originally appearing in *Imago* in 1915 and translated into English by Brill and Kuttner, this essay is here reprinted and rendered available, since the earlier issues are exhausted.

Günther, Hans. DIE GRUNDLAGEN DER BIOLOGISCHEN KONSTITUTIONSLEHRE. [Georg Thieme, Leipzig.]

The chief interests of pathology have definitely been swinging away from static descriptive analysis as more definitely organized in the Virchow cellular pathology and the circumscribed definition of

disease as founded upon the infectious diseases. These conceptions have been of inestimable value but they threaten to destroy wider understanding of causality and lead to hocus pocus in the therapy of many pathological disturbances which are better understood and hence better treated by wider and more truthful conceptions.

Hence the swing towards the study of the "individual" that is sick, rather than the poisons, infections, etc., that make him sick. For disease in its larger aspects is an interrelated series of reactions of the individual to environmental stimuli.

The study of "Constitution" has therefore become once again of primary interest, and many larger (Kretschmer, Bauer, Martius, etc.) and more smaller studies have been issued in the last ten years accenting this group of principles.

The present small volume of Günther, an assistant to the recently deceased Strümpell, is among the best of these smaller manuals and is to be cordially recommended.

Scherk, Gerhard. ZUR PSYCHOLOGIE DER EUNUCHOIDEN. [Julius Püttmann, Stuttgart.]

Dr. Arthur Kronfeld of Berlin has been issuing a collection of minor brochures under the title of *Kleine Schriften zur Seelenforschung* of which this is Vol. XII. It is a small essay of only twenty-four pages, but like others of the series is a very instructive pamphlet.

Proceeding from the platform that now that somatic-clinical descriptive science has practically outlined the chief characteristics of the eunuchoid individual (done very well for American students by Onuf [whose 1912 study is carefully considered by the author], Krauss, and others), this effort would offer the suggestion that the psychological study of the eunuchoid might offer material of much importance to general pathology. He directs his discussion not to the larger and more difficult aspect of the problem, *i.e.*, of the relation of the physical to the psychical, but rather to a narrower and for the present possibly more fruitful situation, namely, in what measure is the development of gonadal structures of limiting activity upon the psychical organization.

His exposition then limits itself to a more definitive description of the psychical characteristics of the eunuchoid after a preliminary excursion into the clinical descriptive phases of the somatic organization. This is done in a very thorough and interesting manner and the monograph is well worth intensive study, since eunuchoid individuals are by no means infrequent among us.

Kronfeld, Arthur. KLEINE SCHRIFTEN ZUR SEELENFORSCHUNG. [Julius Püttmann, Stuttgart.]

Numbers 8, 9, and 10 of this interesting series of minor brochures have just come to the reviewer's table.

Number 8 is by Paul Plaut of Berlin, entitled "Der psychologische Raum." Students of American psychology will recall that Stanley Hall, back in '78, as he established the new psychological laboratory

at Johns Hopkins, was keenly interested in this problem which psychologists before him thought was an unknowable problem (see recent study of Stanley Hall by S. C. Fisher, *Am. Jl. Psych.*, Jan., 1925). True, the present "sketch of a program" goes far beyond the issues of these earlier American studies, for the author has in view the effort at grasping a view of a "Mass Psychology" in its form aspects, *i.e.*, sociological masses in their psychological aspects: an interesting speculative dissertation.

Number 9, by Sydney Alrutz of Upsala, offers a contribution to the "Problem of Hypnosis." This investigator has for a number of years been carrying on experiments which he designates in a Swedish (1917) monograph as "Studies in Nervous Dynamics." Starting from the original Charcot, Bernheim, Forel foundations, he has made a series of carefully mensurated studies, the chief results of which are here presented. (Also in part presented in Ogden's interesting publication in English, *Psyche*.) That the limits of our understanding and interpretation of the "Unconscious" are far from being reached, this delightful essay abundantly demonstrates.

Kurt Hildebrandt of Berlin offers his "Gedanken zur Rassenpsychologie" in Vol. X. At the present time, when through the extraordinary extensions of extrapersonal capacities for environmental contacts, as brought about through the telephone, wireless, and radio, the entire civilized(?) world is being united into some form of an organismic entity—*i.e.*, in a manner of speaking, may be integrated by these agencies—the problems of racial psychology are becoming of paramount importance. When Herbert Spencer spoke of society as an organism, he was dealing with a dream illusion, but one that in a measure is becoming more and more of a reality. Race psychology is therefore becoming of as much importance in an organismic integration as the physiological integration of somatic structures has been in building up the "body as a whole" in its unified working. If we are to look forward to some centuries ahead adaptive integration of the various races on the globe, then the ideas of this essay may become part of the mechanisms by which such a happy result may be furthered. Unfortunately the author has accepted too much of Spengler's pessimism as outlined in his "Fall of Western Civilization" (*Dial*, Nov., 1924), but this cutting critique is not without its value.

Dana, Chas. L., et al. STUDIES FROM THE DEPARTMENT OF NEUROLOGY. Vol. XIV, No. 1. [Cornell University, New York, 1924.]

This happy custom of bringing together the series of studies which have been produced under the leadership of the master in his department seems to have had more coherency under Dr. Dana's guiding hand than elsewhere. Other collections have come and gone. As we put this volume alongside of its brother and sister volumes from other American universities we note the decrease of most of the efforts along this line. In regretting the demise of the many, we congratulate the survivors and would wish that the weak and the

halting might pluck up courage from Dr. Dana's example and resume their lagging industry. For such collections are an emulating stimulus.

Dr. Dana opens the volume with his contribution to the "Research Society's" "Symposium on Heredity" of the 1923 meeting. Kennedy, with Stevenson and Soma Weiss, presents studies on Testicular Teratoma and Thomsen's Disease. The relationship of the latter to the vegetative nervous system disease, as first definitely advocated for textbook purposes by Jelliffe and White in their 2d 1917 Edition, offers sound foundations for these pioneers—still criticized in many quarters as hazardly speculative. W. M. Kraus has an imposing array (eight in number) of very valuable studies, and George Hyslop has at least six useful contributions.

In a review of a previous collection we congratulated Dr. Dana upon his inclusion of a valuable series of psychoanalytic contributions. Their absence in this series is as equally notable. We can only hope it is not a symptom of regression.

Infantile Paralysis in Vermont, 1894-1922. A MEMORIAL TO Charles S. Caverly, M.D. [State Department of Public Health, Burlington, Vt., 1924.]

This is an unusual state document indicative of a growing consciousness of the value of Public Health activities. Furthermore it is a worthy testimonial of a citizen who as physician gave of his best to the state and its interests.

Dr. Caverly's contributions to the study of poliomyelitis in Vermont very aptly begin the volume. These are followed by a series of studies by Lovett, who had thrown himself heart and soul into the social medicine aspect of this pernicious enemy of childhood and adolescence. Then follow a series of able research papers by Aycok, Amoss, and Taylor, all of which are of striking importance.

This volume makes a welcome addition to other efforts in a concerted attack upon this disease, the conquering of which should engage the most enlightened activities of a state medicine, the which is here shown as a hopeful promise for the future.

Spielmeyer, W. TECHNIK DER MIKROSKOPISCHEN UNTERSUCHUNG DES NERVENSYSTEMS. Dritte vermehrte Auflage. [Julius Springer, Berlin.]

A third edition of this important handbook dealing with the microscopical examination of the nervous system is before us. In it the author has incorporated all of the newer technical procedures which have been published since the appearance of the second edition, which appeared in 1914, particular attention having been given to the newer physical and chemical investigations concerning elective staining reactions, thus rendering it the most up to date and valuable work upon histological technical methods for investigating nervous tissues extant.

OBITUARY

JAN MARIUS MOLL

Death has taken grievous toll of the medical profession in South Africa and of the psychiatric staff in the University of the Witwatersrand in particular by removing from our midst the serene, distinguished and lovable figure of Jan Marius Moll. Born in 1879 in the town of Blumendal, at Meerenberg Asylum, the largest of its type in Holland, he was reared in a psychiatric atmosphere for not only was his grandfather Superintendent of this Asylum, but his father was the First Assistant therein and a large number of his relatives have distinguished themselves in this and other branches of the medical profession.

Yet he nearly missed his vocation for under the magical influence of Hubrecht he devoted his student days to a study of the placentation of the bat and gained the distinction of the Gold Medal of the University of Utrecht for his able embryological investigations. Illness demanded his leaving Holland for the more genial climate of Heidelberg, Germany, where he was appointed to the staff of a mental hospital. This determined his subsequent career for, not only did he meet at this time his gifted wife but also, under Nissl (Heidelberg) and later Dubois (Switzerland) the neurological training he had received under Winkler and Heilbronner at Utrecht bore fruit.

Fortunately for the high veldt of South Africa, the lure of her sunshine and elevation and the vista of her future appealed to the gifted young scientist and after taking an English qualification he came to the Westkopjies Mental Hospital, Pretoria—the present clinical training ground of our Witwatersrand students—in 1911, where his abilities soon found expression. The classification of the patients was revised, routine laboratory examinations were systematized, and the present intelligence tests, adapted to South African needs, were introduced. When he came to Johannesburg in 1915 he left behind him a name for hard and conscientious work equalled by few and surpassed by none of his colleagues.

Although practicing in Johannesburg as a Consultant in Mental and Nervous Diseases, he found time for the thorough prosecution

of his appointment as Medical Inspector of Schools and worked out and applied a scale whereby the intelligence of the pupils could be measured. Subsequently, when the School Clinic was established, he was appointed Mental Expert for the Education Department, attached to this clinic, and busied himself vigorously with the whole matter of Child Welfare. He was also the expert applied to by the Juvenile Court concerning the mentality of delinquents. In 1918 he became Honorary Assistant Physician on the staff of the Johannesburg General Hospital but in 1921, on a visit to Europe, his failing health broke down completely. He returned to South Africa in 1922 and was appointed Consulting Neurologist to the hospital and in the following year became the first Lecturer in the newly founded Department of Psychiatry in the University of the Witwatersrand. But he never fully regained his strength and he had not completed his first course of lectures when the insidious illness which daily dragged him lower overcame even his pertinacity. It is not given to many generations of students to witness the noble figure of a man, who was too weak to deliver his lectures standing and whom death had obviously claimed for her own, heroically and unconcernedly carrying on the ordinary duties of life. Particularly is such an example provocative of tradition in a young medical school.

Moll was largely responsible for the present position of Psychiatry in this country. No vaunted cure was too drastic, none too far-fetched to be overlooked in the possible amelioration of mental distresses. He was the first to introduce practically every new and celebrated treatment for mental diseases in this country and to report on their results before medical audiences. He made intelligence tests and laboratory methods in psychiatry a commonplace in this young country. It was natural that he should be given charge of the general psychiatric training of the future graduates in the younger but larger of the two medical schools in South Africa where, largely owing to the initiative of Dr. Moll the importance of this subject is stressed to a degree, I believe, beyond that in any medical school in the British Empire. Psychiatry is here regarded as ranking in value with any of the major divisions of medicine and surgery and its study extends over considerably more than an academic year.

As a prolific and thoughtful contributor to literature, both the purely scientific and the eminently practical and clinical he was well known to a wide circle of Colonial, European and American friends. He left his extensive modern library to enrich the libraries

of the mental hospital and of the medical school. He carried aloft in the Dark Continent the burning torch of a newly lighted knowledge and his loss will long be felt and his kindly influence remembered amongst those who knew his genial and stimulating companionship.

RAYMOND A. DART,

Dean of the Faculty of Medicine.

16—4—25.

N. B.—All business communications should be made to Journal of Nervous and Mental Disease, 64 West 56th St., New York.

All editorial communications should be made to Dr. Smith Ely Jelliffe, Managing Editor, 64 West 56th St., New York.

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ORIGINAL ARTICLES

AN ANALYSIS OF RECENT WORK ON THE PROBLEM OF PSYCHOLOGICAL TYPES.

BY HEINRICH KLÜVER, PH.D., DEPARTMENT OF PSYCHOLOGY
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The words "type" and "psychological" are ambiguous words. We do not start from well defined terms, but only ask: (1) What are the constituents of the concept "psychological type"? (2) What methods of determining types are used? Problems of this kind have always been of great importance to the student of human nature. Innumerable doctrines of temperament and character have been formulated. Laehr's "Die Literatur der Psychiatrie, Neurologie und Psychologie von 1459-1799" presents about 430 sources on the subject of temperament. After 1800, one has actually to deal with thousands of works. Even since the time of differential psychology, much attention has been given to the subject of qualitative variations. There used to be a strong interest in those differences which cannot be expressed as a "more" or "less." Lately the concept of *type* has been introduced in discussion of these differences. There is no doubt that we are dealing here with a concept "the logical and methodological formulation of which belongs to the most pressing tasks of science." (W. Stern in 1911(90)*). Again, it is conceded to this psychology from a quite different quarter that it is of the greatest significance, the following words being those of C. G. Jung in his "Collected Papers on Analytical Psychology" (40): "I must emphasize the statement that this question of types is the question of our psychology and that every further advancement must probably proceed by way of this question." And the result of such assertions

* The numbers in parentheses refer to the numbers in the Bibliography

of urgency? The literature of the last ten years proves, as we shall see later, that there has been no lack of discussions of "type"; but the "logical and methodological formulation" above referred to has not yet been undertaken. In fact, the first impression is a multiplicity too great to be handled. Is it not confusing to hear of "types" of attention, of memory, of intelligence, etc., to see the discovery of "types" of religious or sexual experience, of criminal pathological types, etc? "Types" are established in experimental, applied, criminal and religious psychology, in psychopathology and psychoanalysis,¹ in individual and social psychology. The usage of type in biology, history, sociology and criminology are also to be considered. There is a highly pluralistic picture to confront us. Are the types developed in these fields also psychological types or do they show at least a psychological aspect? Or not even that? And furthermore, has the fact that we observe "typically" in everyday life and make use of "typifications" in contact with others any bearing on the problem of "psychological type"? In other words: what is the relation between the problem of "Verstehen" (understanding) and the type problem?

To begin with, having recognized the complexity of the problem, let us ask the question: Is a definition of type so general in nature as that of Kronfeld² agreed upon by psychologists? Are they in agreement with his statement that in whatever sense the concept type may be applied, it always denotes groups of individuals "who are in some way comparable with respect to their essential characteristics"? Obviously there is no consensus as to this interpretation. Kronfeld's account, which seems to be sufficient to delineate what would be regarded as essential from the point of view of a natural science psychology, seems to be inadequate where we are dealing with the intentions of a cultural science psychology, of a "geisteswissenschaftliche Psychologie." And certainly, Spranger's geisteswissenschaftliche Psychologie is—type psychology.(89)

Ergo, in psychology proper there is no agreement even in point of fundamental aspects of our problem not to mention the confusing multitude of type classifications. There is agreement only with respect to the relevance of the problem.

Under these circumstances it may be advisable for a psychologist not to offer a new type classification nor principles which readily establish such classifications, but to ask questions as to the structure of "psychological type" and the methods of type determination. We try to give the answer to these questions by starting from the works of different investigators who consider the type problem to be impor-

¹ "Jung variety."—Ed.

² Compare Kronfeld (65), p. 223.

tant for some reason or other. Various systematic approaches will be examined. In every case the work is of interest to us only in so far as it furnishes a contribution to our problem. This point must be kept in mind in appraising investigations which may or may not be valuable in other respects. Our presentation will be centered mainly around the work of Jung, Rorschach, Klages, Jaensch, Kretschmer, Ewald, Kronfeld, and Birnbaum.

JUNG

It is obvious that an analysis of Jung's work on the type problem (39-43, see also 12, 13, 94) leads us to a consideration of the widely controverted concepts of psychoanalysis. But it is not our task to consider psychoanalytical concepts in general. We shall confine ourselves to an investigation of the presuppositions of Jung's work about types. (It may be mentioned that B. Hinkle's (24, 25) and Max Freyd's studies (20) stand in close relation to this work.) For Jung, as for Jaspers, (36, 38) the subject-object relation plays the decisive rôle. But Jung treats this relation biologically. The subject-object relation is a relation of adaptation. Different kinds of adaptation contribute different types. That this is a teleological point of departure must be remembered. There is, of course, the possibility of describing different kinds of adaptation in terms of the *object*. Jung condemns this procedure and asks: How do these different modes of adaptation present themselves *psychologically*? Two entirely different attitudes are possible introversion and extraversion. Thus we have two general attitude types, the introverted and the extroverted type. To discuss them is to define more concisely the nature of the fundamental viewpoint here in question.

It is pertinent to ask: How does Jung determine the classification of an individual? How, for example, does he determine that an individual is an "extravert"? "Extraversion," he says, "means an outward turning of the libido. With this concept I denote a manifest relatedness of subject and object in the sense of a positive movement of subjective interest towards the object. Everyone in a state of extraversion thinks, feels, and acts in relation to the object, and moreover in a direct and clearly observable fashion, so that no doubt can exist about his positive dependence upon the object." Elsewhere in a discussion of the type problem in psychiatry he points out that in extraversion (as well as in introversion) we have to do not with the character but with a *mechanism* that can be "inserted or disconnected at will." To speak of an extraverted type is allowed only when we observe an extraverted attitude more than occasionally. We

shall not investigate here the genesis of the extraverted type. Jung speaks of an "undoubted predilection depending upon a certain inborn disposition," but believes, on the other hand, that influences of milieu are "almost equally important." The determination of extraversion in a psychological respect involves, as we have seen, the concept of libido which plays a principal rôle in Jung's psychology. For Jung libido is identical with psychic energy, but he says, on the other hand: "I do not hypostasize the concept of energy, but employ it as a concept denoting intensity or value." Jung does not rest with this somewhat vague "outward turning of the libido." This process has quite a different aspect when thinking is predominant in the general attitude from what it is when feeling is predominant. Put generally, the picture changes with the psychic function that happens to be in the foreground. (Function is defined as "the phenomenal form of libido.") Jung considers thinking, feeling, sensation, and intuition to be the four basic functions.* Corresponding to these basic functions there are four basic types of thinking, feeling, sensation, and intuition. But the general attitude types are superimposed on the four functional types. It should also be noted that thinking and feeling are always "decisively influenced by the motive of reflection." They are therefore rational functions. Intuition and sensation, on the other hand, "dispense with the rational (which presupposes the exclusion of everything that is outside reason) in order to be able to reach the most complete perception of the whole course of events." Thus the two rational functions stand opposite to two irrational functions. We therefore have eight types, since each of the functional types can be introverted or extraverted.

We can comprehend the particular presuppositions of Jung's psychology only when we examine the relations between the basic functions, between "the principal function and the auxiliary function." The discussion of those relations brings us to the problem of the unconscious. The "functional relation of the unconscious processes to consciousness" is described as "compensatory." "The more the conscious attitude maintains a one-sided standpoint, the more manifest becomes the compensatory function of the unconscious." Extraversion means necessarily the extraversion of one of the four basic functions. Jung speaks here of an "absolute sovereignty" which is established "empirically." In an extraverted thinking type there must necessarily be a suppression of feeling. When thinking and feeling both have the same motive power in conscious-

* The departure from psychic functions is found also in the type presentation of R. Müller-Freienfels (70).

ness, then Jung speaks of "primitive mentality." When thinking is the leading function, feeling cannot be even auxiliary. Hence it comes about naturally that the function can only be an auxiliary function, "whose nature is not opposed to the leading function." When thinking is the primary function sensation as well as intuition can be the auxiliary function, but it can never pair "with feeling." We see how one of the most important concepts of Adler plays a rôle here—that of compensation. For Jung, compensation is that "inherent self-regulation of the psychic apparatus" which makes up for one-sidedness of the general attitude. The intensification of the conscious one-sidedness may finally lead to such a strengthening of the counter position that there arises a real opposition between conscious and unconscious. But such compensation in the form of a contrasting function is very rare. The normal case is "a levelling up or supplementing of the conscious orientation."

The further delineation of the four functions—two judging functions (thinking, feeling) and two perceptive functions (sensation and intuition)—will not be undertaken here. Jung is led in the development of his principles to the conclusion that some of these types are represented most often among men and others among women; that the typical form of the neurosis is hysteria in the case of the extraverted; in the case of the introverted, psychasthenia. Now a difficulty presents itself: What we, as observers, note as manifestations are not always expressions "of the conscious attitude." It is undoubtedly often the case that when the individual is convinced "of the reasonableness of his conscious purposes and motivations," the observer is struck only by the irrational character of all his actions. To illustrate, one individual might regard himself as belonging to the thinking type, while the observer who bases his judgment on the behavior would classify him as belonging to the "feeling type." Out of this difficulty arises for Jung an important problem. Shall we draw our conclusions as to the type from the conscious or the unconscious? His decision is that it is the subjective conscious psychology of the individual which must be accepted as the basis. If the alternative course were taken the observer could not coöperate, "because there is nothing of which he is not more informed than about his unconscious." Everything would depend upon the judgment of the observer, "a certain guarantee that its basis would be his own individual psychology." Without doubt, we are here confronted with a difficult problem. One has to admit that definite expressions are not necessarily expressions of definite functions. At this point there arises a certain difficulty for all type

psychologists. Thus Müller-Freienfels speaks of "Affektverkapung," of "Affektbrechung," etc.; Jaspers speaks of "Echtheit" and "Unechtheit"; Stern discusses the differences between "ichgemäsem" and "täuschendem Ichbewusstsein" (91).

How, then, does the Jung school determine that this individual belongs, for instance, to the extraverted thinking type? The answer is unequivocal: we rely upon the reports of the individual, "he is the only competent judge, since he alone knows his own motives." But an objection immediately presents itself: Even if one presupposes an honest effort to give accurate reports concerning all motives (we should not forget that these types can be found in every class of society—among laborers, peasants, and among the most diverse groups of a country), these reports would nevertheless have to be interpreted. That is, in order to arrive at the judgment that a certain person belongs to the extraverted thinking type, the report of that individual (whether he be a peasant or statesman) must undergo a certain transformation which is properly the work of the psychologist.

In general, how is the existence of an extraverted and introverted type determined? What is the proof that there are four basic functions? One searches in vain for any specific data in Jung's treatment which serve as a foundation for his thesis: in his description of particular types he simply refers to his "many years' experience." Thus he remarks in enumerating the functions which he assumes: "I can give no *a priori* reason for selecting just these four as basic functions; I can only point to the fact that this conception has shaped itself out of many years' experience." Why does a psychic compensation of a conscious extraverted attitude lay especial emphasis upon the subjective factor? His answer is: "Practical experience actually furnishes this proof." Hence, the final proof for Jung would lie in a "casuistical survey."

Now Jung himself would not regard his accounts as final, for in the *first* place he believes that the "various attitudes one meets" can be classified from other viewpoints. In the *second* place, such a view would contradict the assumption of the theory of type. Psychoanalysis shows that a "reductive explanation" of Freud and a "constructive explanation" of Jung are both possible. "I believe that other equally 'true' explanations of the psychic process can still be advanced, just as many factors as there are types." Truth would then become a function of the type in question, and objectivity would be objectivity only with reference to these types; but would Jung

acknowledge "objectivity in itself" detached from any psychological bases?

If we appraise Jung's contribution as a whole, we find that Jung in common with Spranger and with Jaspers claims a basis of experience and observation. The value of Jung's attempt lies in the fact that the long experience of a physician is here made accessible to us in condensed form. The whole is based upon the methodology of natural science. The relations to products of art, philosophy, etc., are entirely secondary: the particular individual is the point of departure. It is true that Jung looks later for confirmation of his observations in "the domain of practical psychology." The history of classical and medieval thought, Schiller's ideas on esthetic education of men and his discussion of naïve and sentimental poetry, Nietzsche's distinction between Apollonian and Dionysian, F. Jordan's "Character as seen in body and parentage," Karl Spittler's Prometheus and Epimetheus, O. Gross' study "Die cerebrale Sekundärfunktion," Worringer's "Abstraktion und Einfühlung," the observations of William James and Wilhelm Ostwald—all afford for Jung confirmation of his results based on "numberless impressions and experiences in the practice of psychiatry and nervous maladies, and intercourse with men of all sorts of values." (In this respect Jung's later work on the type problem differs from his early publications, which contain few references to evidence from other fields to confirm his theory).

Jung was quite correct in directing our attention to the fact that so-called objective ("sachliche") differences are often differences of psychological types. But the development of his theme is often very arbitrary. Certain contrasting points, for example, concerning the problem of universals in philosophy *cannot* be dealt with psychologically in Jung's fashion. Before one can offer a psychological interpretation of certain contrasting philosophical positions, one must understand the nature of these different positions. To reach this knowledge is really the laborious task of the specialist. The value of Jung's classification of types—as above outlined—lies in the fact that his psychological theory was derived from "experience." Certain formulations, however, indicate that he unduly neglects the insights gained by other investigators. And how on this basis can we proceed? Will "experience" provide us with new observations and new types? One thing must be borne in mind: the case of *no single individual* affords proof of the manner of functioning of the mechanism of introversion. In Jung's "types" the "typical characters are stressed disproportionately," which implies that the individual features

are just as disproportionately effaced. When it is a question of the empirical determination of the attitude types one doubts whether "everyone" "thinks, feels and acts in such a direct and clearly observable fashion," that his belonging to the extra- or introverted type is quite certain. Furthermore, the equivocal character of the *object* in relation to which everyone thinks, feels and acts, must be taken into consideration. It is obviously impossible to demonstrate conclusively to what particular type an individual belongs where such determining factors as "object" and "observer" are not clearly defined and delimited. Although Jung's concept of "type" collects in a logical sense "common characters disproportionately stressed," this concept cannot be determined—in a logical sense—on the basis of an individual case nor from a summation of individual cases. There is an element in the concept of the "individual" that points beyond the psychology of the individual. Thus the analysis of Jung's work furnishes a valuable result as to our problem: to present psychological types means in a certain sense to be—unpsychological; it means a very definite logical procedure. Such considerations should not be forgotten in experimental approaches to the extraversion-introversion question.

RORSCHACH

In connection with Jung, attention should be paid to H. Rorschach and L. Klages, each of them being the author of a "Psychodiagnostik." First it seems as if the point of departure in their attempts is different from Jung's. In interpreting a certain test material certain types are diagnosed. Concrete empirical findings thus furnish the basis for a classification of types. But a closer examination shows that we here have to do with a procedure that is not fundamentally different from Jung's.

Rorschach (79–80) in his diagnostic apperception experiment is working with casually created forms, with "ink-skeletons." Testing a large number of persons with this material shows that "color-answers" and "kinesthetic answers," that a "Fb-type" and a "B-type" must be contrasted. They must be contrasted, however, only in clinical not in psychological respect. Psychologically, the Fb-type implies that a group of certain functions is strongly developed while in the case of the B-type a group of other functions is prevailing; that means: psychologically, these types only indicate a *difference*. In the attempt to state this difference explicitly, Rorschach finds that the psychic functions of the Fb-type are practically identical with the functions of the—extraverted type, the psychic functions of the B-type identical with the introverted type. Thus "in a purely

empirical manner" the introverted and extraverted type have been discovered.

What does that mean as to method?

Obviously, the experiment does not force us to assume the *existence* of the introverted and extraverted type, but these types are revealed *by way of* the experiment. In other words, Rorschach found "empirically" that the persons who gave "color-answers" (Fb-type) were extraverts, etc. *Thus the existence of the above types is presupposed.* And it is immaterial in this connection that Rorschach and Jung disagree with respect to the psychological constituents of "introverted" and "extraverted" type. As to the psychological constituents, Rorschach points out that Jung's concept of "introversion" has almost nothing in common with his concept but the name. Whether this statement is justified or not would require a more detailed examination which would have to consider the changes in Jung's viewpoint as expressed in his different publications. Apparently Rorschach overemphasizes the difference between himself and Jung. We cannot enter into a discussion of this question. Certain points, however, should be noted. For Rorschach introversion means, roughly speaking, "the turning in towards oneself." It may be active (in the past) or passive (in the catatonic), fixed (in the schizophrenic) and mobile (in the normal person). Thus Rorschach distinguishes between introversion (process) and introvertedness (state), between introverted and introversive. The relation between introversive and extratensive tendencies as it is expressed in the Erlebnistypus ("constricted" and "dilated" types) cannot be considered here. It would be inadequate, however, to suppose that Rorschach is led to this new way of interpreting psychological phenomena by the results gained in his apperception experiment. Jung and Rorschach may differ as to the psychological constituents of "introverted" and "extraverted," but in either case it is the long "experience" of a keen observer which has moulded the type concepts which are now used and *presupposed* in interpreting *empirical* data of experimental or nonexperimental nature. That is the salient point. The fact whether the limited experimental data as gained by Rorschach's experiment form an adequate basis for diagnosis or not can be checked (and has been checked). The adequacy of this basis would merely prove the ingenuity of Rorschach in selecting a material of diagnostic value; the justification for grouping human beings into introverts and extraverts, etc., however, is not gained that way. The necessity of forming these type concepts has arisen "out of many years' experience."

KLAGES.

We now pass to a man whose psychological point of view has also been determined more by "experience" than by the—official psychology of the universities: to L. Klages. His works (47–52) seem to be practically unknown in America. Convinced of the worthlessness of physiological psychology for characterology, he tried to place graphology on a scientific basis. His views have an importance beyond the scope of graphological considerations. It is quite impossible here to give Klages' ideas in a condensed form. That would be the task of a special analysis. His psychological types as gained by the interpretation of graphological material can only be understood in the light of the fundamentals of his psychology. This psychology, however, differs considerably from most—teachable psychologies. Its presuppositions are to a great extent so foreign to current thinking that only a thorough analysis could do justice to them. A few words may be said to indicate Klages' standpoint.

The aim is the fundamentation of the "Wissenschaft vom Ausdruck" (science of expression). It is a historically established fact that an accumulation of empirically found symptoms—graphological or others—cannot be of value with respect to this aim. To arrive at a "physiognomy of functions" is only possible by a deductive treatment of the matter: data, symptoms, "signs," etc., serve to *verify deductions*. According to Klages, all actions of man are expressive. The distinction between "actions" and "expressive movement" is superficial. "There is not, certainly, one psychically anchored function which is not expressive. Moreover, some of these functions point at a definite purpose." We are likely to pay much attention to the *what-for*, to the purposefulness of movements and to neglect the *how*. There is not one action which is entirely conscious. The total and undivided personality is somehow present in every action. It is wrong to assume that the so-called "expressive movements" have a higher symptomatic value than other movements. It is wrong to assume that our consciousness can give us an adequate information about our character: we possess more attributes and traits than we know of. The character is the potential background of our experience; but it is not equally expressed in every *actual* experience.* Moreover, characteristic of every individual is a certain "threshold of expression." In every case, there are on the one hand certain tendencies to expression, certain motives and drives (Triebkraft: T) and on the other hand certain tendencies to resist and to inhibit

* Compare Rorschach's distinction between "leben" and "erleben."

(Widerstand: W). The relation between these two forces, the "reagibility" (R), represents the temperament: $\frac{T}{W} = R.$ † This

R, expressing the "personal reagibility," is indicative of the "Struktur" of the character and not of its "quality," of the how and not of the what-for. Thus one may speak of a sanguine and phlegmatic temperament or type, since formal criteria, a difference in R, led to this distinction; it is not possible, however, to speak of a melancholic and choleric type, as we do not deal here with different degrees of reagibility. The question as to what "symptoms" must be considered as being expressive of certain types cannot be discussed here.

JAENSCH

In determining psychological types one may either be interested in classifying a given group of individuals or in considering the various developmental stages of these individuals. Thus emphasis may be laid on the genetic aspect. Different psychological types, perhaps, have to be distinguished with regard to different courses of development. Here the desideratum is not a comparison of developed personalities but a comparison of personality-developments. In this connection the work of the Marburg School (E. R. Jaensch) about the "eidetic type" must be considered. The studies issued from the Marburg Institute of Psychology during the last seven years try to determine the psychological constituents of this eidetic type. The further aim is to establish a relation between the eidetic type and "general biotypes."

"Eidetiker" are individuals who possess or are gifted with "Anschauungsbilder" (AB: percept-images, visualizations, eidetic images). "The 'Anschauungsbild' is a subjective visual phenomenon which is found in many young people, but not as often among adults; if *e.g.*, a person gifted with AB is asked to look attentively for a while at an object—regardless whether it is two or three dimensional—this person sees the object again whether he closes his eyes or looks at a ground which serves as a background for the image." (23). Oswald Kroh (61–63) defines the AB as "certain images of an hallucinatory distinctness, in other words: special forms of perception-like images." This definition practically coincides with Urbantschitsch's determination of "subjective" AB. It was Urbantschitsch who first dealt extensively with these phenomena in his book of 1907 (93). He sharply distinguished the "ordinary visual

† The *average* amount of T and W are considered to be constant.

memory-image" and the "perceptual memory-image." In the first case the former visual impression is merely "imagined," in the second case the object is really "seen." Emphasis is laid upon the fact that the Eidetiker are able to *see* an object—in the real sense of the word—either immediately after the exposure or after a considerable lapse of time.

The eidetic disposition as investigated by Urbantschitsch is apparently often flourishing on pathological soil. At least, there is a strong influence of "apsychonomic" factors: *e.g.*, the influence of certain physiological processes, of metabolism, etc. E. R. Jaensch, unable to accept the view that AB are of a pathological nature, stimulated his assistants and students to look for persons gifted with AB. Thus, it happened in 1917 that O. Kroh discovered that AB are very frequent and quite normal phenomena at a certain stage of life. Very elaborate researches have been carried on since that time. (Most of the results are published in Vols. 84–95 in the *Zeitschrift für Psychologie*. For a summary see Allport (1) and Koffka (54).)

Jaensch's merit is to have attacked the field of visual AB systematically. Since the eidetic stage represents a normal stage of development, we ought to bring out the relation of the AB to pseudo-hallucinations, hallucinations, and hypnagogic images, etc. The relation to phenomena, observed in adults before Jaensch, should also be considered: the relation to the "memory after-images" of Fechner, the "projected after-images" of Martin (68, 69), the "cerebral after-images" of Bocci, the "subjective vision" of Müller, the "subjective visual sensation" of Meyer, etc. In this connection, the influence of certain drugs (Anhalonium Lewinii) must be taken also into consideration. The relation of AB to other phenomena cannot be discussed here; but special attention will be paid to certain points which the investigations on the eidetic type stress again and again. It is claimed that eidetic investigations have "the importance of a structural-psychological demonstration." That is to say, since "the eidetic stage is to a certain extent a normal stage of development" (28) and since the investigations have shown that certain essential and permanent characteristics of the fully developed consciousness are more distinct in the preceding developmental stage, genetic psychology must begin not with protists, anthropoids or infants, but with that stage hitherto overlooked—with the eidetic stage. Herwig (23) states that among 205 boys in Marburg—10–14.5 years old—76 boys, *i.e.*, 37 per cent, were found to be gifted with visual AB. (See also Krellenberg: he refers to school classes with 32 per cent, 26 per cent, 28 per cent, 46 per cent, 17 per cent, 34 per cent,

respectively). And H. Freiling (19) reports that in Ilseburg Jaensch has found "40-50 per cent very pronounced cases." A thorough investigation of a class of 38 boys having an average age of 12.4 years, revealed the fact that there were only five boys without AB (31).

Kroh (62) found 7 per cent among adults. But even Jaensch believes that not every child passes through the eidetic stage; there always will be cases where one finds no trace of AB even "with the most accurate methods of investigation." The cases we have, however, suffice for him to make the eidetic investigations serviceable to the "Strukturanalyse des Bewusstseins" above referred to.

It is claimed that the same laws hold for eidetic phenomena and the phenomena of normal perception, *i.e.*, that the laws for eidetic phenomena are only "quantitatively different." Starting from this presupposition Jaensch thinks that eidetic investigations furnish the explanation of certain problems of general psychology. The problems of perception with which he was previously concerned are *now* investigated with Eidetiker and the interpretation *e.g.*, concerning localization, horopter, contrast, etc., in the AB is applied to the corresponding phenomena in normal perception. Jaensch considers this standpoint to be justified because of the "psychonomic" behavior of the AB observed by him. All his conclusions are based on psychonomic cases, the other ones are neglected in order to be subjected "to a special consideration." This seems to be the point of view even in the recent publications of the Marburg School.

Since on the one hand AB are apparently in some respect similar to after-images (AI) while, on the other hand, they seem to show a certain relation to memory-images (MI) it is to be expected that Jaensch should aim at drawing a sharp line of demarcation between AI, AB and MI. The determination of AB concerning color, size, intensity, "weight," detail, the circumstances of appearance, the degree of plasticity and flexibility, the degree of coherency, the degree of invariance, the relation to distracting stimuli is made *with reference to* AI and MI. One is primarily interested in the phenomena intermediate between AI and MI presupposing that for the purpose of eidetic investigations we are well enough informed about the characteristics of AI and MI. Again and again the statement is repeated that AI, AB and MI are three grades of memory ("Gedächtnisstufen"). Thus we have a hierarchy of grades of memory (Krellenberg, Busse *a.o.*) the lowest of which is the AI and the highest grade the MI. It is denied that the functions of memory *teleologically* united form a homogeneous unity in so far as their

psychological structure is concerned. Thus we have "memories": a memory of AI, a memory of AB, and a memory of MI.

According to Jaensch, the hypothesis of such a "hierarchy of memory-levels" is apt to throw light on many hitherto insufficiently explained facts of psychology, *e.g.*, on the problem of the "approximate constancy of colors" and the approximate constancy of size of visual objects (Sehdinge). (Compare 22). The results of Krellenberg's investigation about "unitary cases," children of a certain age who have neither AI, AB or MI but only an undifferentiated AB—that implies *e.g.*, that the AB never has the complementary color—are supposed to explain why our perceptions have the above-mentioned constancy and "rationality." MI are, as a matter of course, of "rational" nature, AB show "approximately" the same structure as the MI, and these AB are the ontogenetic origin of our perceptions (the Marburg investigations try to verify that for Eidetiker, and Non-Eidetiker had possibly—eidetic ancestors), *ergo*: the "invariance" of our perceptions is explained.

Upon the basis of W. Jaensch's studies (see especially 32–34), it is claimed that the Eidetiker differ somatically. The AB is accounted one among many psychic and somatic stigmata of the person. The differences between W. Jaensch's T-type (referring to tetany), B-type (referring to the Basedow syndrome) and BT-type as well as the differences between the AB of these types (AB_T and AB_B) cannot be described here. Perhaps the core of the very elaborate theory is that the AB_T have the characteristics of pronounced AI while in the case of the B- and BT-type we have to do with "seen images." By means of introducing calcium lacticum into the organism it is possible to split up the unitary cases of the BT-type into a Basedowoid component (AB_B) and a tetanoid component (AI and AB_T). It is stated that even *weak* AB_B are never influenced by calcium. It might be mentioned that the "pure B-type" has no complementary AB at all. AB_B are easily affected by "thinking" while AB_T show a certain independence. In the case of AB_B the person is able *e.g.*, to influence the localization and the form of the AB to a great extent. He also has a certain influence upon the way his AB appear and disappear. The main symptoms of the two constitutional types may be shortly summarized. Characteristic of the B-type is a certain complex of Basedowoid symptoms, *e.g.*, certain eye symptoms (wide palpebral aperture, slight Protrusio bulbi, change of the dilatation of pupils, Moebius' sign) respiratorio arrhythmia, tremor of the fingers and very active skin reflexes. The chief characteristic of the T-type is a very strong excitability of the peripheral

nerves to galvanic and mechanical stimuli. We have here the symptom complex of the so-called tetanoid state.

The value of W. Jaensch's theory can, of course, be determined only on medical grounds. It is conceivable that the eidetic type is related to certain biotypes. But what is the inner nature of the eidetic type *psychologically*? Our knowledge about this type is limited to results gained chiefly in spatial psychological investigations. Only in terms of experiments are we able to say what we mean by eidetic type. But is an eidetic person not more than a subject needed to solve certain problems of perceptual psychology convincingly? (Even that is not possible according to a study of the present writer carried on in California.) The eidetic individual is living in a qualitatively different world. Do experiments of the above mentioned type succeed in more than a determination of the peripheral elements of this type? In what terms shall we speak of the *central* elements?

Now Jaensch and his co-workers do not overlook this question. We are told *e.g.*, that the character of the works of certain philosophers and poets is strongly influenced by the fact that these persons were Eidetiker. No way, however, is indicated to attack this problem systematically. The exact relation between the work and the eidetically gifted person is not made clear.

One may ask: Is the way in which "meanings" and "evaluations" are attached by the individual to objects of the outer world notably different in eidetic or noneidetic type? And how? Or is there no justification to speak of a psychologically unique type, the eidetic type, if the question is put that way? Our question, furthermore, presupposes that the "meanings" and "evaluations" which arise in the contact between "individual" and "environment" may be considered as a distinguishing characteristic in classifying types. But is this presupposition defensible?

It is clear at the very least that there is a fundamental difference between a description of the behavior of an individual with reference to environmental stimuli (experimental stimuli included) and a psychology which takes into consideration the "meanings," "evaluations," etc., attached to these stimuli. And there is no doubt that the second way leads to a deeper understanding in psychological respect. In this respect Jaensch conceivably does not give us much help since he is concerned chiefly with "problems of the classical theory of perception."

It may be worth while, however, to illustrate briefly in what way he makes use of his experimental results. He relates these results to certain investigations in biology, sociology, history, philosophy, and

education. Philology *e.g.*, has not yet sufficiently explained why the verbs indicating modes of sensing require the accusative (29). Jaensch, having experimentally found that the "optical attention" of the eidetic person really influences localization and form of objects assumes in general that in "the primitive consciousness of the eidetic stage of development" psychic functions exert (in the literal meaning of the word) "a causal function upon the objects of perception influencing, changing, and developing them." Since ethnological material seems to indicate that the eidetic stage has been a phylogenetic stage, Jaensch has no difficulties in explaining the above fact. A Storch (92) now tries to support Jaensch's conclusions by referring to the experiences of schizophrenic personalities. In this connection mention may be made of Kroh's view (63) that the detailed analyses of AB allow the diagnosis of psychopathic types. According to him, such an analysis would furnish a contribution to an "objective psychoanalysis."

KRETSCHMER

The way in which mental measurement approaches the type problem will not be discussed. W. Stern himself (90), who outlined a very elaborate scheme to solve the type problem on this basis, now considers this way inadequate as evident from his later publications. In the following discussion, anthropometric measurements in their relationship to our problem will be considered. These measurements serve as the point of departure in the work of a number of psychiatrists and physiologists. Such works certainly have a psychological side. Just as in the old doctrine of temperament, differences of temperament were traced to certain somatic factors, so also here a certain relation between psychical and physical is assumed. As a matter of course, the mind-body problem as such is practically ignored. Burt states an adequate working hypothesis: "A man is something more than a carcass loosely coupled with a ghost. Material and spiritual are reciprocally involved; and the two together are to be treated as inseparable aspects of one highly complex whole." For this kind of investigation we may analyze Kretschmer's work on "Körperbau und Charakter" (59). Since the work sets out from special psychiatric problems, it may not be apparent at first why it should interest us in a work on the determination of psychological types. As a matter of fact, however, the investigation leads to "general psychological and biological considerations." For Kretschmer as for Jung a two-fold division is the basis; there exist for him "schizothymics" and "cyclothymics." In both these groups we deal with "general biotypes." In the group of schizothymics we are

supposed to find schizophrenic psychotics. Between the normal schizothymic and the schizophrenic stands the "schizoid," who may be either a pre-psychotic case or may be related to a schizophrenic. In the cyclothymic group we are to place circular psychoses and "cycloid" men.

How are schizothymic types and cyclothymic types to be differentiated? The result of Kretschmer's investigation gives us the following table:

	CYCLOTHYMIC	SCHIZOTHYMIC
psychesthesia and mood	<i>diathetic proportion</i> : between exalted (merry) and depressed (sad)	<i>psychesthetic proportion</i> : between hyperesthetic (sensitive) and anesthetic (cold)
psychic tempo	<i>oscillating temperament curve</i> : between changeable and stolid	<i>springing temperament curve</i> : between desultory and tenacious, thinking and feeling continually changing
psychomotility	being adequate to the stimulus, regular, natural	often inadequate to the stimulus, reserved, awkward, clumsy, etc.
affined bodily type	"pyknic"	asthenic, athletic, dysplastic and their mixtures

One thing is apparent: Kretschmer's types are not pure psychological types. One can, as we have seen in other classifications, undertake a psychological division of types without concerning one's self about the bodily. These biotypes correlate certain psychical and physical functions. Kretschmer's interest lies in an investigation of certain constitutional factors: Constitution means for him the totality of all individual characteristics which rest upon heredity. (Compare Hoffman 26, 27.) This concept of constitution is psychophysical. Thus we have on the one hand a clinically determined material (schizophrenics and circulars), on the other hand the results of measurements of bodily structure. Kretschmer uses a very detailed schema for these measurements, markings and descriptions. (For face and skull alone there are about 265 questions.) These measurements were undertaken on about 260 cases (of Swabian descent): 85 circulars and 175 schizophrenics. Over against "the complex psychical endogenous types" stand "the purely empirically-found complex bodily structure types." If constant relations can be found between the two there are, according to Kretschmer, constitutional types psychophysically established—biotypes. Kretschmer does not concern himself with the fact that the diagnosis of schizophrenia and circular insanity involves great difficulties. His bodily structure

types are determined in the following way: Wherever morphological similarities were to be found among a large number of individuals, average values were calculated from the measurements. The same procedure was gone through with the "visually describable signs": the traits whose average value was high were viewed as "typical." Thus what is included in Kretschmer's bodily structure type is an empirically demonstrable common denominator. These common characteristics are expressed in definite average values, as, for example, in average bodily measures. The concrete individual case can obscure the type through "individual" traits. But the best cases represent the type, and the description concerns itself with such types. Kretschmer himself remarks in one place that his types are not "ideal types," and this fact should certainly be borne in mind. They have not arisen through certain "guiding ideas" or "valuations." The statistical frequency-relations between certain bodily forms and certain psychic dispositions constitute for Kretschmer the trustworthy and provable facts, not the single case, "which may be typical or atypical." The individual case can thus be typical; it can correspond to those standards which have been found to construct the type.

Of the bodily structure types determined in this way there are four, the asthenic, the athletic, the pyknic, and dysplastic. It appears then from the material investigated by Kretschmer that the pyknic bodily structure type may be found with the psychic dispositions of the manic-depressive; on the other hand, that between the bodily structure of the asthenic, the athletic and certain dysplastics, and the psychic dispositions of the schizophrenics there is a "plain biological affinity." That among the 175 schizophrenics there were only 2 with pyknic body structure; that among the 85 circulars there were only 4 asthenic, 3 athletic and no dysplastic types, is noticeable. Among the 260 cases only 17 cases were unclassifiable. Kretschmer himself does not lay emphasis on the absolute numbers, but nevertheless the number of unclassifiable cases is rather large. (The analysis of unclassifiable cases is the *experimentum crucis* of every type psychology. At this point it becomes apparent whether the fundamental principle for classification must be given up or changed.) Kretschmer admits that the somatic side is not conditioned by constitutional factors alone but also by exogenous factors: lues, tuberculosis, influences of nourishment, and work. And even where it is not a matter of exogenous factors, the particular case often shows the influence of certain "heterogeneous" hereditary factors: thus we may have a "Legierung" (*e.g.*, pyknic-asthenic mixture on the

bodily side, circular-schizophrenic mixture on the psychic side), or "Kreuzung" (pyknic bodily structure plus schizophrenic mind, or *vice versa*), or "Dominanzwechsel" (different types at different periods of life).

Kretschmer's procedure seems to constitute a more objective method, a method which permits the determination of types which, if not psychological, at least have a psychological side. But there are certain difficulties: even when we know that a pyknic type is usually found with a circular disposition, we still do not know whether the circular state is the only one which is connected with the pyknic type. It is questionable whether this is even "probable." Moreover, what disorders belong to the circular category has not yet been clearly determined. Kretschmer himself has to admit that it is still uncertain whether involutinal melancholias and anxiety neuroses belong to the circular group. In general, it is to be noted that such a method as Kretschmer's, aiming at the psychophysical totality of the person, has often been sought by both physicians and psychologists (56, 91).

Bodily structure *and* psychosis are viewed here as partial symptoms of the one fundamental constitutional organization. With respect to the totality of the various phases of life one is justified in saying that the psychic constitution of a man does not show itself in the endogenous psychosis alone; the psychosis is often only an episodic part. Thus Kretschmer investigates the pre-psychotic personality: beside the anamnesis, he takes into account heredity and engages in characterological family investigation. (He thus carries out a suggestion made by R. Sommer (88).) His results show that the endogenous psychoses do not appear to be anything more than pointed, exaggerated normal temperament types. Kretschmer bases this conclusion on statistical results on over 100 clinical case histories of schizophrenics and circulars. He selects the most frequent character traits among these cases, enumerates them and places them together. For the most part we apparently find the same symptom-complexes here as in the psychoses. In the case of these symptom-complexes everything depends, of course, on the nature of the characteristics considered in the comparison. With Kretschmer we find classes like "friendly," "good natured," "humorous." Perhaps classifications and comparisons of such characteristics are of such a nature as to prove Kretschmer's thesis. The table on page 577 shows how Kretschmer summarizes them. (Let us note in this connection that by diathetic proportion he understands the relation between the hypomanic and depressive elements in the cycloid per-

sonality. The relation of the mixture of hyperesthetic and esthetic elements of the schizoid is called psychesthetic proportion. The presentation of two heterogeneous viewpoints—"psychesthesia" and "moods" [in division 1 of the table]—is questionable.)

Finally we come to a consideration of the *average* man of the schizothymic and the cyclothymic groups. (Seven pages in a book of 175 pages.) The point of departure is here again the study of the bodily forms. Among several hundred men whose psychic and physical characteristics were known to the investigator, Kretschmer chose 150 men "whose bodily structure shows the precise and unmistakable signs of the asthenic, athletic, or pyknic type." These cases were found to conform to the same groupings. The same picture appears for Kretschmer: two large circles of temperament, of which the first stands in relation to the pyknic habitus, the other in relation to the bodily structure of the schizophrenic. In the normal are found the same characteristic features that psychiatric morbidity reveals in distorted proportions. The question at once arises: Are the temperament groups discovered also found **among** those who were omitted in his selection of cases? Kretschmer only took such as had "unmistakable" signs of his bodily structure types. Furthermore, there is danger that in approaching one's problem from the psychological side of the two great psychiatric circles one may get a one-sided view of the normal psychic constitution. It is easy to understand how other temperament groups may be distinguished in the realm of the normal, if one does *not* approach from the circular or schizophrenic circle.

Viewing Kretschmer's attempt as a whole, it has to be said: Bodily structure and endogenous psychoses are considered to be the "two guiding paths" in placing the psychological temperament doctrine upon a firmer basis. The relations to the somatic emphasized by the old temperament doctrine are here to be determined by modern means of investigation. That is, it is not a question of a description and classification of the phenomena lying on the psychic side, but of the relations to bodily processes. The theory which underlies this procedure is about as follows: Since we know "empirically" that the endocrine system influences qualities of temperament, and since we can "actually determine" that the temperaments are conditioned blood-chemically, since furthermore the schizothymic and cyclothymic temperaments correlate with definite bodily structure types, it appears to be the case that temperament types have come into existence together with the structure of the body "through similar humoral parallel effects." These humorally conditioned tem-

peraments influence the "mental apparatus." (See Kretschmer's distinction (60) between "hyponoic" and "hypobulic" mechanisms.) That is, these temperaments must at least influence, as we have seen, the "qualities," psychesthesia, mood, psychic tempo, and psychomotility. If we examine more closely the nature of these "qualities," we soon discover that Kretschmer's temperament-concept is centered about those psychic elements which—as experience shows—"are especially easily and frequently influenced by acute chemical effects of an exogenous (alcohol, morphia) and endocrine kind." (Indeed, psychiatrists especially deal with "psychic qualities" of this kind.) The somatic side is shown to be "prodigiously complex." But it appears to us as though the psychological side had been simplified too much. It will be recalled in this connection what "prodigiously complex" *psychological* relations, analyses such as those of Jaspers reveal. It is important to note that even if the humoral conditioning of "mood," of "psychesthesia," were proved in detail, the work of the psychologist would still be incomplete. For the most inner nature of psychesthesia, etc., would still be dark to us. (One may consult here Jaspers' theses with regard to "somatic pre-conceptions" in his "Allgemeine Psychopathologie.") Kretschmer makes no contribution to the specific problem of "psychological type."

The following account interrupts somewhat the course of our discussion, but is of great interest for empirical research. It is obvious that there is no objection to the empirical procedure of Kretschmer. But this method appears to need (as other investigators have pointed out) certain modifications in its details. Two questions should therefore be briefly discussed here: (1) What results have the investigations of Kretschmer's theses brought out? (2) In what larger context does his work belong?

With regard first to question (1): Kretschmer's results must be verified by further investigations. Kretschmer himself points out this need, for he was well aware that he had too few subjects, that his subjects were of Swabian descent only, that there were fewer women than men, etc. Bleuler agrees with the psychological part of the book. (Münch. med. Wochensch., 1921, 33.) Some direct investigations have been undertaken (21, 35, 73, 87) which have resulted in a recognition of the bodily structure types presented by Kretschmer, as well as their affinity to the two psychoses circles. It is notable that Olivier found among the schizophrenics 9.4 per cent of pyknics, Sioli and Meyer 2.3 per cent, Henckel 0 per cent, Jakob and Moser, among women, 13.3 per cent, among men, 4 per cent.

*Slight variations in the method of making measurements and calculations, the accuracy with which one divides the types, explain certain resulting deviations. The need for measurements of non-Europeans is emphasized. It has been doubted whether the bodily structure types are really individual and biological, rather than racial. According to Kretschmer, the two groups have nothing to do with each other. (See his account in the *Zsch. f. d. ges. Neurol. und Psychiat.*, 82.) From a few observations he believes that he is warranted in concluding that his bodily structure types exist also among the Chinese. In connection with this question it will also be necessary to consider the frequency, variety, and behavior of the psychoses peculiar to the different races. In general one can agree with Henckel, that the investigations undertaken as a check on Kretschmer's results have not improved upon Kretschmer. This is also true of the "*Beobachtungsblatt für klinisch-psychiatrische Typenforschung*," which came out in 1922. No further investigation has been made of type in the sphere of the normal.

Let us now consider question (2): The description of Kretschmer's types reminds one of a whole group of investigations which either emphasize the somatic side alone or place the emphasis upon the statistical relationships. (Compare, *e.g.*, 67, 71, 72, 75.) It appears to many of these investigators quite obvious that one can speak of a "middle" type. In detail Kretschmer's description of the asthenic type reminds us of the "*Typus mikrosplanchnicus*" of Viola, the pyknic type of Viola's "*Typus makrosplanchnicus*." The athletic type recalls the "*type musculaire*" of the French investigators. Naccarati's investigations on the "*morphological type*," which represents nothing else but "*the ratio value of the extremities to the volume of the trunk*," goes back to Viola. In comparison with Kretschmer he undertakes very few measurements. In general, the examination of the literature indicates a certain tendency to three-fold divisions: the nutritional, mixed and nervous type; the herbivorous, carnivorous, and omnivorous type, etc. The manner in which the results of certain physiological investigations have been used for the type and temperament question appears to us to be at bottom hardly different from some procedures based on the older theories of temperament. Compare, for example, Stern's analysis of such attempts with the short account of modern attempts which is given by J. W. Bridges.(11) Here investigations are referred to which bring out the relations between temperament and instinct, between temperament and internal secretion, between temperament and autonomic functions. He shows how it is assumed "that the

dominant instinct may result in either a similar temperament or an opposing one, depending, perhaps, on the nature of one's early training." Or it is assumed that "the type of temperament depends upon the dominating gland—a matter of relative hypersecretion. We thus have a temperament for each endocrine gland instead of for each instinct as above." The impression is that the older investigators in the province of temperament theory did not make it so easy for themselves. The value of endocrinological investigation, etc., is, of course, not questioned, but certainly the value of what has been accomplished in this quarter in the classification of individual differences of a psychological nature is open to question.* In general, Kretschmer's relation to such studies should be clear. His work is in the last analysis an "investigation of one part of the constitutional factors."

We have considered Kretschmer's work on "physique and character" in considerable detail, since it must be viewed as one of the most important attempts to settle the problem of temperament in an objective way. Most of the leading German psychiatrists acknowledge the importance of the results and suggestions of this book. (Kretschmer's attempt has even been paralleled by Spengler's analyses (78). So far as the problem of psychological type is concerned, Kretschmer's book about the "sensitiven Beziehungswahn" (57) is of greater interest to us. It has caused enormous discussion. The author, replying to a critique of Kahn, has to admit that the central problems of this work are of a psychological and not of biological nature (58).

The investigation of the *constitution* must—that is Kretschmer's view—be supplemented by a systematic investigation of *character*. The investigation of the constitution follows the formula *soma-psyche*. The formula for the field of character investigation is: character-experience (*Erleben*). In the first field Körtke's attempt (55) sharply to separate "bodily system" and "psychic system" must be considered fruitless. Constitution is a psychophysical concept; for every "endogenous psychic disturbance" a somatic correlate must be postulated. In addition to such an investigation of the totality of the constitutional factors, it is necessary to do justice to the special nature of the psychic." The same individuality which we previously examined in its relation to the bodily as constitution is now viewed as character in that it represents an object of mere psychic stimulations. Thus, beside the science of constitu-

* In this connection one may compare the elaborations of Paulhan (74), Ribéry (76), Ribot (77), Wundt, Rutz (81), Sievers (86), and Bahnsen (2).

tion there arises the science of character as a second and independent realm." Kretschmer, in describing certain characterological "types of reaction," finds that endogenous and psychogenous morbid pictures are *not* coincident, "that, *e.g.*, a character belonging to the sensitive type of reaction may develop on the basis of a schizophrenia as well as on the basis of a circular constitution." With reference to genesis, to symptoms and course, cases of this kind are governed by the laws of their characterological structure and not by those of their constitutional bases. The diagnosis has to take into account these various factors: "not symptom complex, not disease unity, but disease duality and disease multiplicity." In other words, the "strata-diagnosis"* has to consider "character" as being equally important with "constitution." It is not possible here to show the close relation between this "strata-diagnosis" and Birnbaum's "structural analysis" (6, 8, 9), nor is it possible to examine the views of Kahn (44-46), who rejects Kretschmer's and Birnbaum's attempts and tries to establish a "biological psychiatry on an hereditary basis."

Kretschmer's book about "sensitiven Beziehungswahn" furnishes us psychological types. Certain cases are selected and described as being typical. Indeed, these concrete and life-like pictures evidence the hand of the genuine psychologist. It is not clear, however, how he will finally arrive at a systematic typification of personalities. There is no guiding principle which would determine why certain cases must be viewed as typical.†

EWALD

Constitution and character are also the main objects of investigation for G. Ewald (14-18). Ewald and Kretschmer agree as to the fact that temperament is to be related to certain constitutional factors. But there is no agreement concerning the way constitution and character are defined. Ewald attempts to define these concepts in terms of the underlying *biological* factors. At present, he admits, we are far from knowing exactly the nature of these biological bases, and so far as the more specific character traits are concerned, it seems to be "entirely impossible that we shall ever obtain definite results." It is the task of psychology and psychopathology to cope with the more specific characterological problems. But biology is able to settle certain fundamental questions. A generally acknowledged demarcation, for instance, between the concepts "temperament" and "char-

* Compare Bleuler (10), p. 178.

† Compare Kronfeld (64).

acter" does not exist. Ewald tries to draw this line of demarcation on biological grounds.

In a functioning cell the "*biotonus*," which is dependent on intensity and tempo of metabolism, and the specific *structure* of the cell are to be distinguished. A change in the cellular biotonus that means a change in the metabolism will finally result in a change of tempo and of intensity of the cellular function. A change in the biotonus will not affect the specific way of reacting and functioning. Only a change of the cellular structure will influence the quality of the reactions.

Considering now the nervous system as a whole, the tempo of the function primarily depends upon the biotonus of the organism in question, the quality upon the special structure. The psychic tempo and the "Vitalgefühle" which become manifest in the temperaments depend upon the biotonus; the native character which under the influence of *milieu* and *Erlebnis* is transformed into the acquired character is dependent upon the specific structure of the elements of the central nervous system and upon secretory factors. This biological activity has a quantitative and qualitative aspect. Tempo of reaction and kind of reaction are two entirely different things. Succinctly stated, temperament is psychic tempo + Vitalgefühle; character is the kind, the quality, of psychic reactivity.

Ewald considers the distinction between endogenous (manic-melancholic) psychoses and "reactive" (psychogenous) psychoses as a special psychiatric proof of his thesis. A pathologically increased or decreased metabolism (biotonus) will result in corresponding changes in the psychic tempo: mania or melancholia. Qualitative changes are not to be expected. Only tempo and intensity differ. While the manic-melancholic psychoses may be regarded as "diseases of the temperament," the reactive (psychogenous) psychoses may be considered as "diseases of character"; or, better, as diseases on the basis of an abnormal character, of an abnormal kind of reactivity of the central nervous system. An individual who is highly stimulable with respect to affective experiences may react with one of the many possible psychoses, but his biotonus may be high *or* low.

Ewald, therefore, distinguishes two temperaments: the sanguine or hypomanic temperament (active metabolism and active psychic tempo, often pleasurably toned Vitalgefühle, gay mood) and the melancholic or depressive temperament (low metabolism and slow psychic tempo, unpleasantly toned Vitalgefühle). Of course, the stages intermediate and between these two extremes have to be con-

sidered. One may speak of a normal or balanced temperament with average metabolism and an average psychic tempo. The decisive point, however, is that we are dealing with a continuum, the points of which differ quantitatively with regard to the tempo, etc., of metabolism. Thus we have a sanguine (hypomanic) and melancholic (depressive) temperament, but have not a phlegmatic and choleric temperament. "Phlegmatic" and "choleric" do not designate types of temperament, but types of character, special "qualities of reaction."

It is conceivable that Ewald does not acknowledge Kretschmer's classification of temperaments. According to Kretschmer we have two dispositions as to temperament: the cyclothymic and the schizothymic temperament. According to Ewald there is one disposition as to temperament and one disposition as to character. In other words, Ewald thinks it justified to speak of a cyclothymic temperament and of a schizothymic character. He admits that the cyclothymic, cycloid, and manic-depressive state may rest on the same biological basis. There are only differences in quantitative respect. If we assume that there are two groups of organs, one of which is favoring, the other one inhibiting metabolism, we shall observe a normal temperament and a normal character in the case of an "ideal equilibrium" of these two groups. Quantitative disturbance of this equilibrium does not change the character, but the temperament. A hyperfunction, for instance, of the inhibiting part of the "cerebral glandular apparatus" will result in a melancholic, depressive, temperament and finally in melancholia, but will not change the character. Characterological changes are due to qualitative disturbances of this apparatus, to pathological dysfunctions, or to a loss of the function of one or several glands.

Ewald gives attention to the fact that Kretschmer in his cyclothymic group scarcely finds bodily symptoms which are to be traced back to dysglandular disturbances. But having schizothymics, schizoids, and schizophrenics, we have not only the presence of manifest endocrine disturbances of all kinds, but also the psychic changes in the "psychesthetic scale." That means, changes in the psychic reactivity; in short, in *character*. "Character as a kind of psychic reactivity has (pathogenetically) nothing to do with manic-depressive insanity." Of course, the character of the cyclothymic group may be called "normal," "average," etc. In other words, they have no-character. They are, as Ewald states, uncomplicated, and most uninteresting and boring. A schizothymic individual, however, is always a character in the sense of "personality"; a schizoid char-

acter always represents an abnormal character. Since an "immense variety of the most different character types" are connected with schizothymy and schizoid, one is, of course, not surprised to find a variety of bodily structure types connected with them.

It should be mentioned that in 1922 Ewald (16) reached the conclusion that it is unjustifiable to form a biologically pathogenetic *unity* between schizophrenia and the various psychopathic character types (and various bodily forms).

His point is that it is not possible to consider the different psychopathic character types which are disposed to schizophrenia or really develop into schizophrenics as one group in biological respect. It is, therefore, misleading to create a uniformity by calling these different psychopaths "schizoid." (Ewald's psychopaths, who, on the basis of Kretschmer's "psychaesthetic proportion," would rank as "schizoid," and who, therefore, represented various bodily types [asthenic, athletic, etc.], were tested by Abderhalden's reaction "The result was a rather inconstant one.")

One should not forget that Ewald's biologically determined distinction between temperament and character is a very rough one in psychological respect. Ewald considers the biological factors involved as "tremendously complicated." (So did Kretschmer.) "The characterology, the study of the different kinds of psychic reactions," is the task of—the psychologist. He considers Kretschmer's "sensitiven Beziehungswahn" to be a start upon this kind of work. But Kretschmer's "sensitiver Beziehungswahn" entirely neglects the biological basis. This negligence of the biological basis—to state it succinctly—seems therefore to be the right point of departure for every work on *psychological* types. Even according to—Ewald. A complete account of the biological factors on which a psychological type may rest does not mean anything, is not even possible unless the psychological type, the biological basis of which is to be accounted for, is already defined.*

KRONFELD

The complexity of this process of type determination in the psychological field will be demonstrated from a different angle by considering Kronfeld's views. The problem is: Are the constituents of the so-called psychological (or psychopathic) types not often to a great extent sociological? It is clear that "psychological" and "sociological" types are not coincident. But what, then, is the exact relation between them? Kronfeld, in a series of analyses,

* Compare Kronfeld (66), p. 23.

tries to determine this relation (65). What is the logical procedure by means of which we proceed from the "individuality" to "type"? It goes without saying that this question has reference to fundamental philosophical problems. Analyses, as they are found in the works of Driesch, Rickert, and Max Weber, have a bearing on this question. It may suffice to say that Kronfeld reaches the conclusion that every psychopathic type is an inductively discovered unity. In establishing a type one is trying to find a formula that expresses the interrelation between different psychic functions. It is in most cases not yet possible to state explicitly these relations, nor is it possible to say what psychic functions are involved. But the underlying assumption of every type classification is that the interrelation of the different functions and the way they act together is different in each type. One does not know the exact character of the type-unity, but descriptively gained data, certain observations, force us to assume this unity. This unity is, therefore, the result of an inductive process remaining in the sphere of descriptive psychology.

One may illustrate this process of forming "types" by referring to similar procedures. Psychiatry very often begins with a descriptive enumeration of similar observable states or processes expecting that these states are presumably important in a genetic-etiological respect. Since the psychiatrist has never to deal with two entirely identical cases, he has to abstract from certain individual features of the concrete case in order to arrive clinically at an enumeration of descriptively identical states. These *abstractions* being made on the basis of our present knowledge concerning the elements and functions of psychic life, etc., are of a preparatory nature. An induction of this kind may be, of course, erroneous since the selection of a certain abstraction is to a certain extent arbitrary and may not do justice to the causal relations between the phenomena. Unities arrived at in such a way are, according to Kronfeld, *e.g.*, paranoia, epilepsy and psychopathic types. The above mentioned abstractions are, of course, simplifications. Since the number of psychopathic individuals as well as the number of functional anomalies is considerable, oversimplification must be avoided.

Now a second question arises. Since in the present state of psychiatry and psychology we must make use not only of the psychic phenomena and experiences directly observable, but also of observations on the social conduct of the individual, the question is: To what extent can statements that concern social behavior be used in establishing types?

It is clear that deviations from the social norm are not necessarily deviations from the psychological norm. A certain social behavior cannot always be traced back to the same psychic functions and dispositions; anti-social conduct is not the outcome of a psychologically constant disturbance of these functions and dispositions. If we arrange types on the basis of social conduct we arrive at *types of action* (Tattypen) which are, indeed, not psychological types. The "types of action" established by criminal sociology, as well as the types of delict exactly defined by the norms of the penal law are to a great extent incidental so far as psychology is concerned. Sociological and criminological types are primarily concepts of social *evaluation*. Examining *e.g.*, different types of "antisocial" behavior, the difference between the *legally* determined *crime* and the *psychologically* determined structure of the *person* can be easily recognized. The social provenience can also be readily seen in the formation of concepts such as: "psychopathic inferiority," "affective inferiority," etc. But a classification of types based on a description of observable psychic phenomena and a reduction of these phenomena to underlying functions is not concerned with the social value of these psychic structures.

But is that really so? Kronfeld's decision is that one must not take into consideration social criteria in a *normative* sense. Is it not possible, however, to correlate normative—sociological unities with descriptive—psychological unities? There are two possibilities. The first way is to collect and to compare the different psychic motivations leading to certain types of action; the second way is to determine the peculiarities and differences of psychological types with reference to the social environment. Kronfeld in examining the literature of criminal psychology (Aschaffenburg, Gruhle, Homburger, Liepmann, Wilmanns) believes in the inadequacy of the two approaches.

Now what is the solution? Aiming at a delineation of psychological (or psychopathic) types, it is sometimes necessary to make use of social criteria besides direct psychic characteristics, of social criteria not in a normative but in a *descriptive* sense. That means: certain social actions must be viewed as the expression of a special kind of "reactivity." In some cases it is possible to arrive at "types" as descriptive entities without going back to the social behavior as an index of this reactivity (in this connection Kronfeld names organic psychoses, dementia precox and cyclothymic types), but in other cases an adequate psychological description is not possible without referring to certain social actions. It is *e.g.*, not possible to

characterize an erethistic imbecile completely from a psychological point of view without reference to his social conduct. Thus different kinds of reactivity are illustrated by Homburger in naming the "pathological swindler," the hysteric-eccentric and paranoic types. Differences of types are differences of "reactivity." Reactivity as the outcome of a specific interrelation of psychic functions does not imply—as indicated above—that we are always clear about the interrelations and the nature of the basic psychic functions involved. Briefly stated: since direct observation shows us clearly distinguishable "typical" reactions, we are led to the assumption of different kinds of reactivity; since certain social actions constantly occur, as observation shows we assume the agency of certain psychic functions. Thus reactivity is a "directly observable psychic constant" which represents a point of departure for a classification of psychopathic types even if there is not yet any possibility of an exact scientific determination of the basic psychic functions of a character. Social behavior being an index of this reactivity must be taken into consideration so long as differential psychology does not succeed in finding other and more delicate indices.

What does Kronfeld's introduction of the concept "reactivity" mean with regard to the problem of "psychological" types? Social behavior may be viewed as the expression of a psychologically uniform reactivity; social behavior may be viewed from a criminological-normative standpoint. Whether a criminological-normative unity of social behavior is also a psychological unity depends upon the fact whether this unity is based upon one or several reactivity types. "Reactivity" is the connecting link between criminology and criminal psychology, between "sociological" and "psychological" types. Social behavior as the *expression* of a certain psychological reactivity is, of course, different from "social behavior" as a factor influencing certain reactivity types. Here the question of the *influence* of exogenous factors arises. Again, it becomes clear that Kronfeld's considerations are a contribution to *criminal* psychology as he sharply relates reactivity, psychologically defined, to a milieu that is "psychologically" defined and means a complex of legal, economic and social forms. Thus we have not to deal with a milieu viewed as the sum total of environmental stimuli. Whatever stimulus one may choose, it is always possible that even this stimulus may lead to some kind of psychic response. Having an overwhelming multiplicity of stimuli, one cannot see how it could ever be possible to establish a lawful relation between milieu and psychologically determined unities. There is some hope to arrive at such a relation if one

means by "milieu" certain definite economic, etc., forms. Kronfeld relates this milieu to the different types of reactivity. To state it more sharply: to select from the reactions of a certain type a group of reactions, namely its milieu reactions in order to submit these reactions (or omissions of them) to a special analysis is different from comparing all kinds of reactions of a type (some of which may be social) with the view of tracing them back to a certain reactivity. Kronfeld, we think, has shown that both ways are promising and fruitful for criminal psychology. He has not shown how it is possible to distinguish types on the basis of psychological criteria. Distinctions made without reference to nonpsychological criteria are to be expected from—the future. Being—perhaps—able to distinguish reactivities, we are unable to distinguish the different psychic basic functions involved in each case. Even Kronfeld would admit that in this sense his reactivity types are not—psychological types.

BIRNBAUM

Some of the problems touched upon by Kronfeld are also dealt with in the investigations of Karl Birnbaum (5, 7). Birnbaum's considerations start from a distinction between "psychic disease types" determined clinically and criminal pathological types. Now the question arises: is it possible simply to identify clinical and criminological forms in such a way that one classifies the symptom complexes of the clinical types as to their criminal importance? The following difficulties arise. Starting from clinical viewpoints, one arrives at the result that pathological forms, clinically closely related, (*e.g.*, alcoholic delirium and chronic alcoholism) are widely separated from the standpoint of criminal pathology. On the other hand, forms closely related from this standpoint (*e.g.*, the alcoholic and epileptic character type) are clinically entirely different. For *practical* purposes Birnbaum comes to a classification which is, indeed, a compromise. Emphasis is laid upon the criminal pathological point of view, but at the same time he tries to do justice to clinical differences. In the first group, Birnbaum places the more severe morbid processes, the apoplectic, arteriosclerotic, and paralytic forms, schizophrenic types, etc. The second group embraces "pathological deviations"; that means chiefly "native or early acquired, in general stationary, pathological psychic states which especially reveal deviations of an intellectual, emotional or characterological kind." Birnbaum now brings out the important criminal pathological differences between these two groups. (Compare 7, pp. 53-116.)

But this compromise does not settle the question as to the *theoretical* relation between psychopathological and criminal pathological types. The nature of the former is rigidly fixed by biological processes, the latter are mainly determined by social evaluations as they are expressed in criminal law, moral law, etc. Is there really a relation between these two groups? The solution is to be found in the "social psychic functions," in Meynert's "secondary" ego: the normal psyche is in a certain sense identical with a "psychic constitution being socially adaptable."

Birnbaum's discussion may lead us to some conclusive remarks. Our aim was to obtain clarity as to the constituents of "psychological type" and the ways of classifying types. Our study has brought out the entirely different meanings attached to this concept. It should not be forgotten that we almost exclusively dealt with types orientated biologically (Klages' position is not quite clear in this respect). The investigators starting from biological considerations would be in agreement with such a general definition of type as set forth by Kronfeld (p. 562). In opposition to such a natural scientific type, the type concept of "cultural science psychology," the "ideal type," ought to be considered. An analysis of the views of E. Spranger, M. Weber and K. Jaspers cannot be undertaken here. It may suffice to say that the publications of these men treating upon the problem of types have on the one hand a bearing on methodologically extremely important problems of psychology (and psychiatry) and on the other hand reference to contemporary discussions in philosophy of history. The psychiatrist may be referred to the studies of L. Binswanger (3, 4) and Kronfeld, which develop some of the consequences of the most recent findings of psychology for psychiatry. But what is the step to be taken to arrive at "psychological types"? The answer cannot be given without taking into consideration the above mentioned investigations which are not orientated biologically. It may be indicated that one of the first necessary steps is an unbiased phenomenology of the psychic. Not much has been done in this respect. But the work of Jaspers, Kronfeld, Schneider, Schilder and Scheler is a beginning. One may compare *e.g.*, Birnbaum's treatment of "social psychic functions" and Jaspers' searching analysis of the "problem of the understanding of the other person's ego" to see the different point of departure. Or the difference may be illustrated by mentioning the names of two men whose ideas will furnish a foundation for coming investigation on the type problem: C. G. Jung and M. Scheler.

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STUDIES ON DEMENTIA PRECOX

A STATISTICAL INVESTIGATION OF VARIOUS CONDITIONS
WHICH MIGHT HAVE AFFECTED THE BRAIN BEFORE
THE ONSET OF THE DISEASE

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PSYCHIATRIC CLINIC OF THE TOKIO IMPERIAL UNIVERSITY

(Continued from page 497)

260	N	K	42	Grandfathers Parents								25
261	N	K	32			Father tb.						21
262	U	H	17									16
263	Y	K	27	Grandfather Father						Cephalgia		24
264	N	K	34	Elder brother Maternal grandfather								33
265	M	H	50	Moth. (nervous) Father					?			42
266	K	K	53	Younger sister								26
267	A	K	27	Paternal grand- father Uncle Father				Poor		Weak		26
268	A	K	44									19
269	K	K	43			Intermarriage						25
270	I	K	19	Father						Nephritis at age 19		18
271	N	K	31									?
272	M	K	26	Parents Abnormal char- acter							Cruel treat- ment by step- mother	15
273	T	K	27	Uncle								25
274	N	K	33							Typhoid fever at age 23		32
275	E	K	43	Father								29
276	Y	H	36			2 brothers congenital lues?		Poor				15
277	N	H	54	Mother								33
278	F	P	52	Many psychoses 20 idiots in rel- atives								34
279	T	P	53	Child dumb								30
280	O	P	53	Father								50

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TABLE II. (Continued)

No.	Name	Diagnosis	Age	Heridity			Symptoms previous to Onset					Age at Onset	Present somatic symptoms
				Psychoses	Alcoholics	Others	Bodily development	Mental development	Diseases	Trauma in head	Others		
281	H	H	53	.....	Father	.....	.....	.....	.....	.....	.....	28	.....
282	S	K	42	.....	.....	.....	.....	.....	.....	.....	.....	40	.....
283	S	K	46	.....	Father	.....	.....	.....	.....	.....	.....	38	Saddle nose
284	O	K	32	.....	.....	.....	.....	.....	.....	.....	.....	31	Dolichocephalus
285	I	K	33	.....	.....	.....	.....	.....	.....	.....	.....	31	.....
286	K	K	49	Mother Elder brother 7 psychoses in relatives	Father	.....	.....	.....	.....	.....	.....	21	.....
287	I	H	32	.....	.....	.....	.....	.....	.....	.....	.....	30	Microcephalus Circumf. 49.5 cm.
288	O	K	26	Elder brother	.....	Grandmother Elder sister tb.	.....	.....	Weak	.....	.....	19	Childish con- stitution
289	K	H	39	.....	Father	.....	.....	Poor	.....	.....	.....	35	Microcephalus circumf. 48 cm.
290	F	K	33	.....	.....	.....	.....	Poor	.....	.....	.....	32	.....
291	F	P	47	.....	Father Uncle	.....	.....	.....	.....	.....	.....	33	Circumf. of head 55 cm.
292	K	K	36	Mother	.....	.....	.....	.....	.....	.....	.....	31	.....
293	Y	K	26	.....	.....	.....	.....	.....	.....	.....	.....	26	Strabismus
294	K	H	38	Paternal grand- father	.....	Father Uncle tb.	.....	.....	.....	.....	.....	20	.....
295	T	K	39	Younger sister	.....	.....	.....	.....	.....	.....	.....	34	.....
296	M	K	31	.....	.....	Mother and brothers and sisters cephalgia	.....	.....	Cephalgia	.....	Abortus previ- ous to onset	21	.....
297	K	K	48	.....	.....	2 younger sis- ters tb.	.....	.....	Convulsions	.....	.....	28	.....

298	O	K	39	Father	Paternal grand- father	Parents consan- guinal						32	.....	Saddle nose
299	Y	H	52	.....	.....	.....	Poor	Night terror	Trauma in head at age 3	.....	.....	31	.....	Defect of del- toid muscle
300	U	H	38	.....	.....	.....	.....	.....	.....	.....	Angry temper	21	.....	.....
301	M	P	53	Father	Father	.....	.....	.....	.....	.....	.....	37	.....	.....
302	O	K	26	.....	.....	.....	.....	.....	.....	.....	.....	24	.....	.....
303	F	H	19	.....	.....	Grandmother Aunt tb.	.....	.....	.....	.....	.....	18	.....	.....
304	I	K	29	.....	Father	.....	.....	Weak Night terror Cephalgia	.....	.....	.....	28	.....	.....
305	K	P	41	Maternal grandfather	Father	.....	.....	.....	.....	.....	.....	41	.....	.....
306	S	H	33	Sister of pater- nal grandfather	3 younger bros. Father	.....	.....	Weak Cephalgia	.....	.....	.....	37	.....	Circumf. of head 57 cm.
307	N	H	33	.....	Father	.....	Poor	.....	.....	.....	.....	22	.....	.....
308	I	H	33	.....	Father	.....	.....	.....	.....	.....	.....	32	.....	.....
309	O	H	23	.....	.....	.....	Poor	.....	Trauma at age 7	.....	.....	21	.....	.....
310	K	P	64	Maternal grandmother Elder brother Elder sisters 2 cousins	Father	.....	.....	.....	.....	.....	.....	30	.....	.....
311	S	K	35	Cousin	.....	.....	.....	.....	.....	.....	.....	21	.....	.....
312	N	K	21	Paternal grand- mother	.....	.....	Poor	Convulsions	.....	.....	.....	19	.....	.....
313	M	H	22	Mother (degen- erate)	.....	.....	.....	.....	.....	.....	Fever previous to onset	19	.....	.....
314	M	K	20	Uncle Aunt	.....	.....	.....	Vertebral caries Pleuritis	.....	.....	.....	20	.....	.....
315	Y	P	41	Elder brother Maternal grandmothers & brother. Aunt	.....	.....	.....	.....	.....	.....	.....	32	.....	.....
316	O	H	34	Elder brother Father's uncle	.....	Twin	Poor	.....	.....	.....	.....	34	.....	.....

TABLE II—Continued

No.	Name	Diagnosis	Age at onset	Heredity			Symptoms previous to Onset					Age at Onset	Present somatic symptoms
				Psychoses	Alcoholics	Others	Bodily development	Mental development	Diseases	Trauma in head	Others		
317	K	H	25	Uncle Younger sister		Brothers and sisters tb. Tb.	Poor	Poor				25	
318	T	H	53		Grandfathers			Poor		Trauma in head at age 4		30	
319	N	K	38	Paternal grand- father's brother Uncle		Parents Cephalgia						22	
320	O	K	30		Father							26	
321	H	K	33	Mother (Imbe- cil)	Father	Elder sister younger bro. tb.	Poor	Poor	Weak		Illegitimate with her own brother	24	
322	S	H	22	Father	Father		Poor	Poor	Delirium at age 9			?	Circumf. of head 50 cm.
323	S	K	28		Father	Maternal side tb.						27	
324	S	H	37		Father	Sisters tb.						24	
325	Y	P	53		Paternal grand- father. Father							44	
326	S	K	45	Father	Younger bro- ther		Poor	Poor			Onset after de- livery	33	
327	S	K	34									32	
328	M	K	47	Father				?	Cephalgia	Angry temper		26	
329	N	H	27	Uncle Elder sister								22	
330	K	K	30					Poor				19	Dwarf
331	Y	H	27	Father	Grandfathers	Many abortions in brothers and sisters			Meningitis in childhood			16	Facial asymme- try
332	K	K	24		Father							21	

[illegible]

TABLE II—Continued

No.	Name	Diag- nosis	Age	Heredity			Symptoms previous to Onset					Age at Onset	Present somatic symptoms
				Psychoses	Alcoholics	Others	Bodily develop- ment	Mental develop- ment	Diseases	Trauma in head	Others		
353	S	K	43	Mother Aunt	Father							27	
354	Y	H	40	Mother Uncle	Father			Poor				19	
355	O	P	44	?	?	?		Poor				38	Circumf. of head 50.5 cm.
356	K	H	26	?	?	?		Poor	?	Trauma in head		28	
357	Y	H	23	?	?	?	Poor	Poor	?			22	Circumf. of head 50.5 cm.
358	M	K	33	?	?	Illegitimate	?	?	?	?	?	32	
359	F	P	56	?	?	?						?	Struma Facial asymme- try. Keratitis
360	I	H	54	?	?	?	?	?	?	?	?	26	
361	F	K	35	?	?	?						34	
362	I	K	68	?	?	?	?	?	?	?	?	?	Ovarial cyst
363	I	H	38	?	?	?	Poor	Poor	Weak			23	
364	S	K	43	?	?	?	?	?	?	?	?	40	Circumf. of head 50 cm.
365	K	K	51	?	?	?	?	?	?	?	?	29	
366	K	K	63	?	?	?	?	?	?	?	?	?	Keratitis par- enchymatosa
367	N	K	?	?	?	?	?	?	?	?	?	?	Facial asymme- try. Keratitis parenchymatosa
368	O	H	45	?	Father	?	?	?	?	?	?	30	
369	K	P	42	?	?	?			Metritis			30	Microcephalai Circumf. of head 57 cm.

No.	O	K	45	? ?	? ?	? ?	? ?	? ?	? ?	? ?	? ?	? ?	? ?	? ?
370														
371	Y	K	29	Mother	?	?	?	?	?	?	?	?	?	Pubic hair sparse
372	T	H	42	?	?	?	?	?	?	?	?	?	?	?
373	K	K	42	?	?	?	?	?	?	?	?	?	?	Deep pigmentation of skin
374	Y	H	45											Asymmetry of mouth angle
375	T	P	67	?	?	?	?	?	Pock at age 4	?	?	Alcoholic	?	Microcephalia Circumf. of head 49 cm.
376	W	K	42	?	?	?	?	?	Poor	?	?	?	?	?
377	S	P	53	Uncle	?	?	?	?	?	?	?	?	?	?
378	M	H	53	?	?	?	?	?	?	?	?	?	?	?
379	F	P	37	Elder sister	?	?	?	?	?	?	?	?	?	?
380	K	P	34	Father	?	?	?	?	?	?	?	?	?	?
381	K	H	63	Younger sister	?	?	?	?	?	?	?	?	?	?
382	S	H	38	Father	?	?	?	?	?	?	?	?	?	?
383	M	K	51	Elder sister	?	?	?	?	Poor	?	?	?	?	Facial asymmetry
384	S	K	56	Paternal grandmother, Cousin	?	?	?	?	?	?	?	?	?	?
385	K	H	35		?	?	?	?	?	?	?	?	?	Childish constitution
386	N	K	60	Maternal grandfather	?	?	?	?	?	?	?	?	?	Deep pigmentation of skin
387	T	P	37		?	?	?	?	?	?	?	?	?	?
388	H	K	40	Father	?	?	?	?	?	?	?	Prostitute	?	Baldness disease

Interpretation of the Results

(1) Hereditary relationship may be summarized as follows:

	Male	Female	Total
Hereditary evidence	246	142	388
	101	55	156 (47.2%)
	111	63	174 (82.8%)
Unknown	34	24	58

Thus 47.2 per cent of the cases show hereditary evidence as precipitating cause. The same is given as 65 per cent by Bleuler, 70 per cent and 53.8 per cent by Kraepelin at two times. Okazaki's statistics of Japanese patients showed it to be 40.7 per cent and is nearest to our result. All these would favor the conclusion that a large percentage of dementia precox patients are hereditary laden. Differing from our result and from most of author's, Diem found the hereditary evidence only in 7.1 per cent of cases. The difference can be explained by the fact that Diem took the psychoses of the nearest relatives only into consideration and psychopathic personalities were altogether excluded from his study. The relation between stem and collateral heredity is shown in following table:

	Male	Female	Total
Stem heredity	45	33	78 (23.6%)
Collateral heredity	85	46	131 (39.6%)

The stem heredity can further be analyzed as follows:

	Male	Female	Total
Father	16	12	28 (8.4%)
Direct			
Mother	16	11	27 (8.1%)
Indirect	15	11	26 (7.8%)

Kraepelin gives the direct inheritance as 33.7 per cent, being apparently more numerous than that of our result. However, it must be remembered that in his study brain diseases are included in addition to mental diseases.

Those having more than two psychotic relatives reach to 32 in male and 23 in female, occupying one-third of the hereditary laden.

(2) Alcoholism: The relation of the alcoholism in ancestors and the offspring can be seen in the following table:

	Male	Female	Total
Alcoholism	246	142	388
	93	56	149
	118	55	173
Unknown	35	31	66

This shows that 46.2 per cent of the dementia precox are the offspring of alcoholic forefathers, contrasting to 20 per cent of Okazaki, and also of Rudin, to 25 per cent of Woefrotha and to 26 per cent of Bleuler.

(3) Previous history: Convulsions in childhood were found in 22 cases of male and 29 cases of female, 8.4 per cent being of all

cases. History of trauma in head, poor bodily development, severe diseases, etc., were found in a considerable number of cases.

Poor intellectual development was found in 48 cases of male, and 28 cases of female, 21.9 per cent being of all cases. Dementia precox is the disease which often develops on base of the feeble-mindedness and such is called "prophhebephrenia." According to Kraepelin this type of dementia precox occurs in 3.5 per cent of the patients. According to our own experience this percentage seems to us less than it actually is. Kraepelin interprets the feeble-mindedness as incipient symptoms while Weygandt claims it to be independent. Our observations would seem to favor the latter theory.

As to the relationship between abnormal character of the earlier life and the development of dementia precox Kraepelin appears to think that the former precedes the latter as an early symptom of the disease. In our present study abnormal characters have not been dealt with and therefore nothing definite can be said on this question.

(4) Physical examination: Abnormalities which seemed to be significant are 59 cases, *i.e.*, 15 per cent.

CONCLUSIONS

Cases marked in the table showed evidence which might have affected the brain in some way previous to the onset of dementia precox.

These are 173 men and 104 women, being 71.3 per cent of investigated cases. If 27 of male and 15 of female cases of which little is known are excluded from the table the percentage of abnormal cases would be 80 per cent.

Thus 80 per cent of dementia precox patients are the least number which showed abnormalities previous to the onset of the disease. This fact appears to be more than a mere coincidence. However, as for the exact relationship between abnormal previous conditions and later development of dementia precox the present study is insufficient to be conclusive. We shall therefore proceed in the next report to the histological study of the brains of dementia precox and hope to bring out this fundamental question more in light.

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MENTAL AND PHYSICAL STRAIN (TENSION) IN
RELATION TO DISEASE, NOTABLY CHRONIC
CATARRHAL OTITIS AND EYE DEFECTS

BY LAFORREST POTTER, M.D.

OF NEW YORK

There are no more significant words in our language than those of strain, and its antithesis, poise. Poise and equilibrium are synonymous terms. Equilibrium is fundamental to mental and physical health.

In the study of mental and physical strain in relation to disease we enter the field of psychophysiology. Psychology is a *bête noire* to the average physician but it must be reckoned with. However vague its terminology it deals with energy potential which belongs to that vast reservoir of untapped human power of which the late William James speaks in his "Energies of Men."

One cannot complacently wave aside as "imaginative" or hypnotic the therapeutic findings in the psychology of disease for many of them are accredited by qualified observers of the caliber of Janet, Freud and Jung of Europe, the late William James, and Prince. White, Kempf and Jelliffe in this country.

The clearest and by far the most practical psychotherapy before us to-day, the most direct approach to the therapy of the whole man, is that which includes the method of treatment known as psychoanalysis, because it contains the kernel of scientific and psychologic truth. We still lack a psychosynthesis, for "the concept of psychic energy comprises biological relations between body and soul."¹ Freud, of Vienna, is undoubtedly the father of psychoanalysis and Jung, of Zurich, not inaptly may be said to be its mother, for the Swiss psychologist has sublimated the Freudian conception in truly intuitive fashion.

It is not my purpose to enter the speculative field of psychology beyond what seems necessary to define my thesis and argue its claims. I wish to call attention first to the fact that the psychological factor constitutes 50 per cent or more of all healing; second, to the practical application of this fact in chronic catarrhal otitis and eye defects.

Orthodox physicians will doubtless consider the theories and

¹ Kempf.

practice laid down in this paper as fanciful and unpractical, *but* the clinical facts remain and like Banquo's ghost they "will not down." Diseases of the eye and ear hitherto incurable are being cured. Old physiological concepts are changing—new theories of vision and hearing are coming to the front.

My observations are based on a general and nose, throat and ear practice extending over a period of fifteen years, two of which include clinical studies in the hospitals and post-graduate institutions of this country and Europe.

With two exceptions, the cases cited are taken from the writer's public clinic, chiefly because clinic cases are available for investigation. These cases stand for types of disease which have been successfully treated on the psychophysical principle for fifteen years.

This method is applicable to all disease but it is in eye and ear affections that it has, at present, its most vivid expression, for the reason that man reacts on his environment chiefly, if not wholly, through *sensation*. Of this sensation, sight and hearing are, through their physical outlets and their spinal and autonomic nerve relations most accessible to physical treatment.

It would be presumptuous to attempt to state the modus of mechanical and mental stimulation. We may however, in the face of an urgent need for more tools with which to combat increasing human ills, and for the sake of the larger application of the principle of psychophysical therapy, feel justified in formulating a working hypothesis based on scientific research.

We have accomplished much in the prevention of disease, but we have failed to realize that there still remains mental disorder which is not vitally touched by modern medical science.

Let me consider briefly first, the psychological and second, the physiological aspects of the problem. In discussing the psychological aspect of healing I shall avoid, as far as possible, psychoanalytic terminology, first, because of a suspicion, which may be entirely gratuitous, that the average practitioner, through too much concern for that form of analysis which stresses the reasoning powers and too little concern about the higher psychic energies, which are in a quite different category, often confuses both himself and his patient; second, because in practice I have been compelled to explain psychology in terms of the patient's understanding.

Science and philosophy agree that what we call the objective world is largely semi-illusion.² Mental strain springs from miscon-

² Kant, James, Lodge, Einstein.

ceptions concerning this illusion and consequent misuse of what we call our conscious ideas and emotions. We need to remember that the *whole* of truth is not attained through ideas. Ideas are merely *tools* wherewith to orient environment for the purpose of tapping higher energy. Thus the so-called facts of science are nothing more than hypothetical *tools* which men have wrongly agreed to call final truth. Even mathematics starts from a point which, as Euclid tells us, has no parts or magnitude and is therefore based on pure abstraction. [Vaihinger³ very aptly uses Kant's phrase "*fictions*," and shows the practical utility of such nonlogical constructs.—Ed.]

Conscious thinking is commonly divided into the categories called induction and deduction, but *there are mental energies* which are quite apart from these qualities of thought. These energies are only passively recognized by science and philosophy. They manifest as a "*vis medicatrix*." They function in the heart, respiratory and digestive processes. They are at the back of invention and business foresight. They are the chief factor in our ideals. We call them unconscious energies. Their power in relation to the conscious energies has been metaphorically compared to an iceberg, the bulk and greater power of which is *below* the surface of the water. Their function so far as man is concerned seems to be to develop *sensation* from its most primitive beginnings in space and time, to the concept of a God and Good. As sensation evolves the factual consciousness feels and conceives a consciousness which transcends the so-called fact. Facts become symbols of higher potency and greater fact.

James has said "our ideas of cosmic objects are but ideal pictures of something whose existence we do not inwardly possess but point to outwardly. The inner state is our very experience itself." What is this inner state—this highest truth which man feels and conceives? It is the concept of a world of harmony which men have agreed to call Good. It springs from a common nucleus functioning in a sense of something wrong in us from which we seek to be saved by making proper connections with a higher power. It is evidently man's job to train his ideas and emotions of the objective world to do team work with his emotions and ideas of the highest subjective world of inner experience.

It has been demonstrated that this can be achieved through introspection and realization of the relation of this higher ideal self—that is, the world of symbolic good, with an objective or factual world of the illusions of ill, and *to an understanding of the mental*

³ Vaihinger. "The Philosophy of the As If." Harcourt, Brace Co., New York.

and physical laws which govern this relation. A realization which leads not alone to theories and dreams of human behavior but to an application to life of that quality of human behavior which can be squared with one's highest ideals of good.

This does not mean a philosophy of mere end gaining, or specific cure ⁴ to the neglect of the *means* whereby the cure is to be affected. It is rather a coöperation between these forces, through which, as Jelliffe significantly puts it, there is appropriated a "symbolic dynamics."

In dealing with the higher psychic energies of inner experience, it is with peculiar satisfaction that I find it possible to demonstrate, on concrete lines, the power of that misunderstood energy we call imagination. There can be no doubt that this mechanism is a major tool in human consciousness, for it pictures all those memories both personal and racial which stand for the *essence* of human experience. Our modern science needs men and women of imagination—practitioners who can soak up the so-called facts of life and dynamize them with that spiritual energy of higher power.

If this power can be more constructively utilized in physical and mental disease, if, for example, we can cure cataract, glaucoma, strabismus and deafness by means of energy about which heretofore only speculation has been possible, we will have relieved not only much human suffering, but stimulated scientific research toward the higher possibilities of man.

There is, of course, a vast difference between a constructive and a nonconstructive imagination. Many of us seem to be saddled with an inescapable habit of the latter. The imagination of man is seldom under control. It may be likened to a camera focused to a riot of distortion. The constructive power of the imagination is conditioned by the capacity to inhibit the confusion and illusion of conscious limitation in a shifting world of phenomena and absorb, in measurable degree, the subconscious energies of harmony.

As a first step these conditions are made possible for sight and hearing by stopping the incoming ocular sensations by covering the eyes with the hands for certain periods and by occluding the external auditory canals with the fingers. *If this process is accompanied by the right mental condition a new power of sight will come.* From this first step there is no limit to the further cultivation of the imagination, and no limit to the marvelous results which may follow. The facts that confinement in a dark room, and the phe-

⁴ John Dewey has devoted much space and time to an indictment against what he calls the fallacy of end gaining or specific cures.

nomenon of natural sleep have not achieved any definite remedial results in eye disease will occur to the reader. These facts are explained on the assumption that in these cases a very inadequate use is made of the imagination—such, for example, as would result from a passive mental attitude toward better sight. There would be no clear cut mental and physical images of restored vision such as would result from its constant assurances through tests on a Snellen's card.

That which is accomplished for sight is achieved for hearing. Hints of this possibility are evident; for example, apart from certain types of deafness, how much better one hears after the rest of sleep. From the point of view of stimulation of the imagination, how acute becomes the auditory power under excitement, *e.g.*, in grave danger.

The writer has found that a fair degree of anesthesia can be attained by closing the external auditory canals with the fingers. The point is simply to stop the strain of *trying to see and hear* in a world of illusion and confusion and at the same time stimulate, through the imagination, the inner perceptive cell activities.

So much for psychological explanation. We now come to the consideration of the physiological aspect of our problem. Mental strain means physical strain—both lead to functional and organic disease.

In order to offset mental strain we must remove the physical conditions which make strain possible. In removing physical obstruction we are unquestionably *coöperating with a libido or creative energy which is striving to inhibit focal tensions and establish equilibrium or gravity conditions in the cell and cell group*. I wish to emphasize this important point for it seems to me, in dealing with mental disturbance, there has been too great an emphasis placed on the mental and too little on the physical factors.

The power we call God started us in matter, and it is through matter we reach higher altitudes of life. The release of tension and restoration of equilibrium in physical structure make possible an *appropriation* of psychic energy because ideas and emotions are, *in part*, the *result of bodily changes*. I say in part, for *beyond* the ideas and emotions which are produced through environmental stress is the *life urge*, the *libido* or craving—in a word, the creative energy which reaches man through what may perhaps be called a supreme emotion.

The physical treatment considered in this paper concerns mechanical and radioactive electrical stimuli. It is based on the following biological law, namely: "The essential principle of living substance

is its property of altering its metabolism and transforming its energy." This principle is known as irritability and the agents which can excite it (heat, light, electricity and chemic and mechanic agents) are known as stimuli.

Mechanical stimuli are fundamental to human progress. Through their operation equilibrium or gravity conditions in physical structure become possible. The significance of gravity power in relation to treatment has been vividly expressed by Jelliffe.

The mechanical procedure in deafness is as follows: The patient is instructed to close the external auditory canals with the fingers for the purpose of inhibiting confusing sound waves, assume the proper mental attitude, and practice this procedure at home night and morning. The index fingers of the physician are inserted into the auditory canals and the parts are carefully dilated.⁵

In all ear cases we find abnormality of nasal structure. The whole pharyngeal area shows overgrowth and degenerate tissue. The Eustachian tubes are atonic and prolapsed. The tonsils of Gerlach (tubal tonsils) are hypertrophied, often occluding in various degrees the tubal orifices, thus interfering not only with the air intake, but through the tensor tympani, with ossicular movement and labyrinthine pressure.⁶

In the nose we observe deflected septa, enlarged turbinates and imperfect sinus drainage, notably that of the ethmoid, from pressure of the enlarged middle turbinate. These abnormal conditions result in a drainage of septic matter into and around the Eustachian orifices.

The index finger of the operator is inserted behind the uvula into the nasopharynx, the Eustachian tubes are dilated and their prolapse rectified by manual means. The tube tonsils, paratubal tissues and adenoid overgrowth, which is often plentiful in obscure areas of the pharynx, for example, the fossae of Rosemüller, are manipulated through pressure.

Each nostril is thoroughly dilated, septal deflections reconstructed, sinus blockage broken up and normal drainage established by means of the little finger. *It is to be observed that no instrument is used nor blood shed in this treatment.* In the intergration and disintegra-

⁵ Politzer (5th Edition) has shown that the external cuticular layer of the tympanic membrane is a continuation of the cutis of the external canal, between which there seems to be a constant relation through vessels and nerves.

⁶ Pohlman, writing on the mechanics of the middle ear, says when the tensor tympani contracts the stapes is plunged deeper into its fenestra, increasing the pressure of fluids in the inner ear and that the pressure of the perilymph and endolymph is entirely dependent on the arrangement of this muscle.

tion of structural development each cell possesses an inherent integrity which any traumatism, however slight, will jeopardize. Furthermore, advanced science tells us that in the use of the mechanisms of the fingers we are dealing at first hand with cell dynamics.

CHRONIC CATARRHAL OTITIS

Case 1. Female, age forty-five. October 12, 1924. Housekeeper. Duration of disease, ten years. General health, excellent. Last two years, deafness increasing. Obligated to discontinue work, constant tinnitus. Tympanum thickened and retracted, marked ossicular fixation, paracusis Willisii. Hears tick of alarm clock in right ear one-eighth of an inch; left ear one-fourth of an inch. Voice right ear, two feet; left ear, one foot. There has been weekly improvement in this case. Patient now hears (January 7, 1925) clock tick right ear, twelve inches, left ear, fifteen inches. Voice, right ear, ten feet, left ear, fifteen feet. Tinnitus improved 50 per cent. Resumed work last month.

CHRONIC CATARRHAL OTITIS

Case 2. Duration twenty years. September 25, 1924. Suffers much tinnitus, cannot hear ordinary conversation. October 18, hears clock tick, right ear, one-half inch; left ear, twelve inches. January 4, 1925, right ear, tick, fifteen inches, left ear, three feet. Tinnitus greatly improved.

CHRONIC CATARRHAL OTITIS

Case 3. Age sixty-five years. Duration twenty-five years. October 29, 1924. Daughter says it is necessary to shout close to the ears to make patient hear. Constant and distressing tinnitus. Patient has had treatment by inflation and electricity with no result. Tympanum shows tentpole retraction and ossicular fixation.

Alarm clock tick, right ear, one-eighth of an inch; left ear, negative. Voice heard only by shouting a few inches from the ear. Tuning forks indicated a mixed catarrhal and nerve deafness. From October 29 to January 7, 1925, there has been gradual improvement. Patient hears ordinary conversation. Tinnitus much modified.

TREATMENT OF EYE DEFECTS

In the treatment of eye cases glasses are absolutely forbidden. The eyes are covered by the hands from five to thirty minutes. On their removal Snellen's test card is read at ten, fifteen and twenty feet, and the power of the imagination tested. Abnormal interocular tension of the eye balls is modified by manipulation, and the incoördinated muscles are reëducated by resisted exercises.

The patient is advised to cover the eyes with the hands several times during the day, for periods of five minutes, also to read fine print six inches from the eyes, five minutes before rising or retiring. Exposure of the eyes to the direct rays of the sun as frequently as possible is also advised. From time to time the physician applies an

eighteen focus burning glass to eye balls. Apart from three cases of absolute glaucoma, two of senile cataract and one of strabismus, all of which are well on the way to recovery, there is, at present, insufficient data for further report of eye cases.

THE RADIOACTIVE ULTRA VIOLET RAY TREATMENT

When we remember that the last word in the scientific definition of energy is electronic radioactivity and that the ultra violet rays carry, in large degree, this potential, we can understand what Sir William Osler meant when he said: "May not man be the radium of the universe?"

Physiology teaches that the driving power of the system is nerve impulse—that there can be no normal action in the human body if its nerves lose their conducting power. Biology teaches that the growth of every living thing is dependent on electrical supply. The life of crystals, the development of volcanic rock, the growth of plant life, all depend on the electromagnetic currents of the earth for their driving power.

Precisely in this way man grows. His food is acted upon by his human electricity and through it new tissue is formed. There can be no doubt that man through his delicate reflex nervous system receives and projects a vast radioactivity. The retina of the eye is 3,000 times more sensitive than the photographic plate. When aerial waves are more than 36,000 vibrations a second the ear cannot hear sound. When 450,000,000,000 vibrations have been reached we perceive light.

The clinical results already attained in this field bespeak great promise for the future. In chronic catarrhal deafness, as well as in chronic running ears, where no extensive caries exist, remarkable cures have been made by the quartz lamp. A case of chronic otitis, with extreme deafness of fourteen years standing, was cured in twelve treatments. The rays in this case were applied both to the drums and the surface of the body.

A case of chronic suppurative otitis of long standing was cured in ten treatments. The rays were applied directly to the drums.

The Nevada, 2025 Broadway, New York City.

SOCIETY PROCEEDINGS

NEW YORK NEUROLOGICAL SOCIETY
THE FOUR HUNDRED AND TWENTY-SECOND REGULAR MEETING,
OCTOBER 6, 1925, THE PRESIDENT, DR. I. ABRAHAMSON,
PRESIDING

AN UNUSUAL AND PROTRACTED CASE OF SCHILDER'S DISEASE

DR. WALTER M. KRAUS

AND

DR. ARTHUR WEIL
(By Invitation)

A small number of cases of diffuse brain sclerosis have been reported. In 1912 Schilder selected a few and adding two of his own, defined a disease which he called encephalitis periaxialis diffusa and believed to be a clinical and pathological entity.

Many different names have been used to characterize the disease which indicates the divergence of opinion regarding its characteristics and the variations which may occur. We find encephalitis periaxialis diffusa, chronic diffuse encephalomyelomalacia, *sclérose intracérébrale centrolobaire et symétrique*; or a more general classification under diffuse sclerosis. The list of cases accepted as this form of diffuse sclerosis is different in each paper on the subject.

In reviewing the cases reported, we find that in general they give the impression of a toxemia which spreads diffusely through the central nervous system, often comprising the subcortical region of a whole hemisphere. In the spinal cord it may extend from the cervical to the lumbar regions. The disease is not restricted to any particular decade. Most of the cases die between the ages of twenty and forty-five. Both children and adults were affected. The duration of the disease is from weeks to fifty-two years.

The case which we report is that of a Russian Hebrew tailor, born in 1877; family and past history negative. In 1911, while walking in the street, he suddenly fell utterly helpless and could not get up. There were no convulsions, no loss of consciousness. Sensory disturbances, ataxia, pain, and anesthesia to touch, were noticed in all four extremities, but disappeared after a few weeks. Cranial nerves normal with the exception of slight protrusion of tongue to the right. In December, 1911, there was slight concentric contraction of the visual fields. At this time he also showed diminished reaction of smell and slight tremor of both hands; inexhaustible ankle clonus

on right, exhaustible on left; inexhaustible knee clonus on both sides. Upper abdominals were present; lower abdominals absent on the left; pseudo-Babinski on the right and markedly exaggerated knee jerks. No ataxia. Occasional incontinence of urine.

This condition remained nearly unchanged for a period of five years when the patient was discharged from Montefiore Hospital. After a period of another five years, in 1921, the same neurological status was revealed with an increase of the eye disturbances, insufficient convergence of the right eye, weakness of the rectus internus and externus on both sides; irregular pupils with reaction to light, but none in accommodation. The right arm was weaker in comparison to the left and biceps and triceps reflexes were lively on both sides. Slight ataxia in left arm. Marked ataxia on right. Ataxia of both lower extremities with loss of sensation of position of toe. Marked Romberg. No sensory changes. The gait was peculiar; it could only be carried out with the help of a cane and was characterized by small steps with shuffling of the feet. Every time the foot touched the floor there was hypertension at the knee. Speech was very rapid and scanning with peculiar repetition of the last word of each sentence. This condition became progressive until in July, 1923, the patient could not stand or walk any more. There was a mild degree of dementia.

In March, 1924, complete left hemianesthesia was noted. In June, 1924, the patient died after an acute attack producing left-sided convulsions and anesthesia. We wish to emphasize the onset with spinal symptoms, the remissions, and the great variety of signs and symptoms.

In the histological examination of the central nervous system the most striking finding was the great extent and localization of demyelination. In gross sections of the whole brain stained for myelin sheaths, demyelination involved all of the lobes and the corpus callosum. Most of the arcuate fibers were intact, and dark colored, forming a striking contrast to the pale color of the underlying demyelinated area. Similar areas of demyelination were present in the basal ganglia, cerebellum and pons. The patches of demyelination were very clearly separated from the unaffected nerve tissue.

In the spinal cord, the transition between demyelinated and intact areas was more diffuse. Definite tracts were not affected, the area of degeneration involving the pyramidal tracts as well as the extrapyramidal and marginal tracts; and varying from segment to segment. The posterior columns were almost unaffected.

Wherever examined, the destruction of the axis cylinders was not parallel to the demyelination. In specific axis cylinder stains, it was found that in a given area the number of axones was greater than the number of myelin sheaths, but most of the remaining axis cylinders showed signs of swelling.

The anterior horn cells in the segments of demyelination showed in some instances signs of beginning degeneration, swelling, disap-

pearance of Nissl bodies, fine granulation and vacuolization. No conspicuous cell changes were noted in the brain.

In the brain, where destruction of the myelin sheaths occurred, marked increase of glia tissue was noticed. The scar formation was marked in the subcortical region. The blood vessels showed a perivascular infiltration with marked vacuolization of the surrounding tissue and great dilatation of perivascular lymph spaces. Perivascular small cell infiltration was noticed especially in the region of the corpus striatum and was combined with small hemorrhages. Throughout the whole brain, accompanying the blood vessels, large amounts of amyloid were found in the form of small globules which were closely packed in the subarachnoid region and around the ependymal layer of the ventricles. Fat stains revealed numerous cells laden with small fat drops in the outer layers of the cortex and the pia. The meninges did not show any signs of acute inflammation and were intact except for slight edema with thickening of the pia arachnoid over the convexities of the brain.

If we summarize this histological examination we find a markedly diffuse demyelination with new formation of glia tissue and a perivascular reaction. This picture, both in the brain and spinal cord, was very distinctly different from multiple sclerosis, not only in type, but also by the manner of its extension and diffusion. The histological picture seems to justify the claim that this disease is a pathological entity.

Discussion: Dr. J. Ramsay Hunt said: The interesting case which Dr. Kraus has reported I recall examining a number of years ago with the late Dr. Joseph Fraenkel. I remember that we were rather puzzled by the clinical picture at that time, which presented both cerebral and spinal features. Multiple sclerosis was considered, but we were more inclined to think of a cerebrospinal arteriosclerosis, largely because of the very characteristic *marche a petit pas*.

During the years in which I was especially interested in pathological anatomy I was on the outlook for cases of diffuse lobar sclerosis, so-called, but never encountered them.

I would like to ask Dr. Kraus if the axis cylinders were involved in the sclerotic areas in his case, or whether they showed that preservation in the old sclerotic areas which is so characteristic of the pathological lesions of multiple sclerosis? This brings up the interesting question as to the possible relationship of this disorder to some cases which have been hitherto regarded as belonging to multiple sclerosis.

Dr. I. Abrahamson said: The patient was under my observation during his entire stay in the Montefiore Hospital. During the first period he presented the peculiar gait of rapid, short, side to side steps, a repeated stammer of speech, an inexhaustible ankle clonus on both sides, but without a definite or constant Babinski sign. He flushed very easily, especially on observation or on being asked to exhibit his gait. The marked suggestibility suggested to some of the observers the diagnosis of hysteria; but most of us felt we were

dealing with a disease that had some evidences of organicity. The gait on closer examination differed markedly from that seen in *dysbasia arteriosclerotica*; there were no evidences of arterial disease. Upon his second admission into the hospital, the signs and symptoms were markedly accentuated and new and definite signs were to be found, making the condition an undoubted organic one; and, at that time, I entered in the hospital records that he presented a syndrome that was not known to me by experience or by reading. I called it a new disease and owing to the fact that certain features, as the tremors, the gait, and the speech, had been observed in post-encephalitic basal ganglia disease, I predicated that the site of the morbid process was most likely in the basal ganglia. This condition became rapidly worse, and it was soon evident that we were dealing with a diffuse and widespread disease which also affected the basal ganglia. The diagnosis of Schilder's disease was made post-mortem on the pathological findings.

Dr. Joseph Globus said: The diagnosis I have made, and later verified by anatomic study, in the case referred to by Dr. Abrahamson, was "diffuse subcortical encephalopathy" and not "Schilder's disease." I do not believe that Schilder himself would so dignify a disease picture which lacks in uniformity of pathological process as well as in the clinical manifestations. From 1912 to 1924 Schilder reported in all three cases. What characterized these cases? First, a change in the white matter, but this was not limited to one particular area or to a given system of tracts. It was not a strictly systemic disease. No two of the three cases reported were exactly alike in the extent of the involvement of the white matter. Nor is it true that in all the cases was the disease limited to the white matter alone. Look at his illustrations and follow his description and you will see that he is dealing primarily with a diffuse meningo-encephalitic process; he speaks of meningitis with numerous lymphocytic cells in the subarachnoid space. You will see also cortical involvement with a definite productive inflammatory process in the gray matter. With such a bizarre and disseminated pathologic process little can be said for a definite disease entity and simply because Schilder has assembled a few unusual forms of encephalitis, does not make it necessary to name a disease after him.

In the small number of cases which he put under the name of *encephalitis periaxialis diffusa* there is fairly definite evidence of an inflammatory process with secondary degenerative changes. He tried to include and group with his cases a number of other encephalopathies where degenerative features were predominant without being able to suggest a common etiologic factor.

Now, what is there in the clinical picture to establish it as a disease entity? He speaks of blindness which he claims is due to involvement of the occipital lobes, but in two instances there was papilledema established, leading to the diagnosis of brain tumor in one instance, with craniotomy and a fatal issue as the result. With such findings is it necessary to call upon occipital localization to explain partial or

complete blindness? It is also said that mental deterioration is caused by involvement of the frontal lobe and that peculiar changes in the sense of smell occur early in the disease because of changes in the temporal lobe. Between the frontal, temporal and occipital lobe involvement there would appear that there is not much left to become involved by the disease process, and it certainly does not support the belief that such a wide *localization* is characteristic of the pathologic process in this so-called Schilder's disease.

What is there in the finer histological picture? Throughout his material there are numerous inflammatory foci. Perivascular infiltrations with plasma cells are common. In all three cases the process is rather acute and progressive.

Recently a few cases have been described by English observers but they differ from those described by Schilder in that they present features more of a degenerative form of disease with little evidence of inflammatory changes.

I think great care should be exercised in attempts to establish the nature of the disease which we are all too ready to name after Schilder, without there having been established such a disease entity. For the time being we should group such cases with the subcortical encephalopathies as a disease process as yet of an unknown origin, primarily involving the white matter, and leave it at that, until we know more about it.

Dr. Walter M. Kraus (closing) said: In answer to Dr. Hunt's question about the degeneration of axis cylinders, they were degenerated in some areas, while in others a good many were present. The destruction of axis cylinders has been observed frequently, and apparently makes the present name of the disease, encephalitis periaxialis diffusa, an inaccurate one.

I am very appreciative of Dr. Abrahamson's comments.

As to Dr. Globus's remarks, in general, I am quite in sympathy with what he says. He says that it should be called a diffuse subcortical encephalitis, and with this statement I agree. I do not believe his comment about the optic nerve changes and the disc changes, because I do not believe that a slight choking is in any way a cause for complete blindness. I may not have understood Dr. Globus, but that is what I thought he said. I do not believe that this could be used as an argument at all. Only three of the thirty cases showed eyeground changes. The differences between inflammatory and degenerative types is a difficult problem, but it has been observed that in some cases the scar tissue overgrowth is very marked and in others very limited, depending largely on the duration of the disease. As to the diversity of symptoms, I should say that a process so generalized would naturally produce diversified symptomatology. I think that the disease can be made into a syndrome, but that it always starts in the occipital lobes and travels forward is not correct. To give Greenfield and Collier credit, they state this in the latter part of their article. They have simply attempted to establish a syndrome for the majority of cases.

I think the problem of classifying this condition is difficult. However, the case reported coincides with those from Greenfield's laboratory and with a number of the others. I made the comment at the beginning that there were approximately thirty cases recorded, and I emphasized at that time that the different authors writing on the subject have rejected some and included others as typical cases. I feel that all the men who are in touch with this condition should judge each other's material personally and form some conclusion in that way.

A CASE OF PSEUDOHETEROTOPIA OF THE SPINAL CORD

DR. ARTHUR WEIL (by invitation)

[AUTHOR'S ABSTRACT]

The case reported was that of a twenty-two year old man who died of tuberculous pneumonia at the Montefiore Hospital. No anatomical lesions of the spinal cord were found during the autopsy, and the meninges were intact. After the opening of the dural sheaths, a cord-like formation was found at the anterior surface of the cervical segment which measured two to four millimeters in diameter, and which went down to the upper dorsal segments, where it disappeared gradually in the spinal cord. This formation was partly closely connected with the spinal cord, and partly separated from it by the pia.

In transverse sections at C-IV a formation was seen at the anterior part of the spinal cord, which resembled a reduced half of the spinal cord, and which consisted of gray matter in the form of an anterior horn surrounded by nerve fibers. At first the diagnosis of a duplication was made, but in serial sections it was proved that the small cord which was without a pia gradually lost its gray matter and fused with the original cord. It disappeared totally at the level of the mid-thoracic region and here the definite character of the artefact could be proved by demonstrating the loss of part of the anterior horn and anterior columns with laceration of the pia. The artificial duplication had been produced during the autopsy by pulling the cord upward and thus separating a part which was glued together with the original spinal cord at a higher level.

A study of the literature of the last three decades reveals that most of the cases of complete duplication of the spinal cord which had been published were artefacts. Among the remaining, no case could be found which could be traced back to a double embryonic anlage. Most of them were produced by the formation of embryonic fissures, curvatures of the medullary plate or separation of the spinal cord by new formation of the spine, connective tissue overgrowth or tumors.

The case reported impresses us again with the necessity of proving the artificial character of a duplication by complete serial sections and by demonstrating the presence of a lesion of the meninges or of the spinal cord substance.

THE NEED OF PSYCHOANALYTIC CLINICS AND
INSTITUTES IN AMERICA

DR. L. PIERCE CLARK

The progress which has been made in the field of neuropsychiatry within the past two decades has been striking, for largely within this period we have seen the formation of mental clinics for the study and treatment of nervous disorders as a necessary part of the curriculum of the medical school. Their existence as a separate entity, however, in different cities and communities has been one of the important accomplishments of the National Committee of Mental Hygiene. While these mental clinics have aimed to render medical and social service and help the individual to make conscious adaptations, their function has not met the great problem of the neurotic wherein the unconscious motivations of his disorder must be brought to light.

My suggestion for the founding of psychoanalytic clinics or institutes is not unique. Two such clinics have been in existence for several years in Vienna and Berlin. During my visit to the Ninth International Congress of Psychoanalysts, held in Bad Homburg in September, I had a long conference with the heads of both these clinics, and I was particularly interested in the development of the one in Berlin. In 1918, Freud stated that the time was not far distant when it would be regarded as an urgent duty of the state to give aid to the soul as to any other life-saving and health-promoting agent, and thus psychoanalysis would be made accessible to an increasingly wide circle of peoples in all conditions of life.

The difficulties encountered by Dr. Eitingon and his colleagues to establish the Polyclinic in Berlin are somewhat similar to those experienced in this country. After the World War they found that neurotic disorders had grown without measure and the confidence of the public in psychoanalytic procedure had kept pace with this urgency for relief. Under the stress and misery of the war it seemed that a sort of Utopian policy was about to be put into operation, for the government officials apparently were willing to do almost anything to advance the cause of the nervously sick. When the collapse came, however, they not only withdrew their sympathetic support, but actually became hostile to all former promises. In this country, immediately after the Armistice, we all know how even the more popular and well established institutions suffered. It is, perhaps, but a natural heritage of war to expect this attitude to follow in economically depleted countries, but certainly we were not exempt from this calamity, and private means for promoting research, which has always been our strongest point, had to be requisitioned. Under similar arrangements in Berlin, psychotherapy continued to advance.

Abroad as well as here the lay and medical public ask the question: How can psychoanalysis ever hope to solve more than a small part of the psychoneurotic problem, with a system of individual treatment and prolonged analysis of the single case? This need not trouble us so greatly if we but follow the wise course of the Berlin psycho-

analysts, who did not shrink from even small beginnings and were willing to devote the necessary time to this task. In 1919, the operation of the Berlin Polyclinic began in a moderate way with three assistants and was privately financed over a term of years. Several volunteer assistants were added, but the burden of the work was carried forward by the full time staff. Later the staff increased to seven members who devoted jointly twenty-seven hours daily. This did not include the private analyses of the psychoanalytic union, which consisted of a supporting outside group of psychoanalysts, as well as analyses made under the clinic's control by the students of the Polyclinic. In three years the Polyclinic found itself pressed for space beyond the five rooms at its disposal. Furthermore, the loose or democratic union had to give way to a more consolidated working system under the fixed control of its founders. Members of the staff received a fixed remuneration which bore no relationship to the amount of time given or the work actually accomplished.

As the number of patients increased, the Polyclinic required an almost continuous increase in the numbers of its staff, and the question arose in regard to training assistants. There was a great demand for teaching analysis in order to educate analysts. This was the second aim with which the staff entered upon the foundation of the institute.

It is a firm and all too well founded conviction that no person who has not been analyzed should become a member of the ranks of practicing psychoanalysts. Passive self-analysis takes a decesive place in the education of the analyst and is given in the latter part of the course after intensive theoretic preparation by the lectures and courses. In 1920-22 twenty-five pupils were analyzed, including several physicians and teachers. Through theoretic studies and self-analysis already well prepared, consultations with patients were entrusted to pupils, when suitable for beginners. The pupils were allowed to take the first steps of analysis alone and required to keep an accurate record, and with this as a guide the teachers were readily able to make corrections. In this way the host of errors made by the beginner, due to defective comprehension of the aims and methods of analysis and too rigid adherence to single findings, was avoided.

The patients comprise the intelligent and professional class as well as the lower middle class of working people, of all ages. Interviews covered three-quarters of an hour or the classic full hour, and the patients came on an average of three or four times a week and were seen oftener in severe cases. One hundred and thirty-three analyses were carried out, which is indeed an imposing number for such careful and searching analyses as were given, and in 1922 Dr. Eitingon was able to make a formal report of statistics. The question of hastening the treatment was given constant consideration, but such a plan has met with little success, despite zealous employment of the requisite time.

The Polyclinic feels satisfied with the results of its teaching

activities, for the pupils have learned much and well and have shown the soundness of the idea. But this is only a beginning. The possibilities of the project are yet to shape themselves and they hope to make strides in the right direction in the not too remote future.

From the foregoing account we are made aware that through the organizing of such clinics or institutes differs from other medical clinics, such institutes in this country are not only feasible and practicable, but are a matter of the utmost urgency. I do not believe they should be organized on the lines of the ordinary mental clinic or be an integral part of them at the outset; later, when the didactic functions of such clinics come to the fore, the need of their close affiliation with neuropsychiatry and psychiatry will be obvious.

In conclusion I submit: (1) That psychoanalytic clinics and institutes are a necessary part of our armamentarium for the therapeutic alleviation of the large mass of neurotics who cannot afford to pay for psychoanalysis as now practiced. (2) That such clinics are necessary for maintaining a consistent school in the training of psychiatrists and psychoanalysts, and thus obviate the present tendency to quackery in this specialty. (3) That these clinics should be independent in organization, but allied to our medical schools and hospitals. (4) That full time service of the resident staff should be expected with a controlling or advisory board of analysts to support and give direction to the therapeutic and didactic work of the clinic or institute.

Discussion: Dr. Gilbert V. Hamilton (by invitation) said: The issue that Dr. Clark has defined here, viz., the need for psychoanalytic clinics, is strikingly exemplified by the findings of the Division for Psychobiological Research of the Bureau of Social Hygiene. We deal largely with young married college graduates who are living on incomes of less than \$5,000 a year. Many of these subjects of our research disclose maladjustments, of one sort or another, in the marital relationship, and are obviously in need of what the quite limited number of adequately trained New York psychoanalysts have to give them. Unfortunately, my subjects could not pay such psychoanalysts half the fee per hour that I am required to pay my dentist if they were to be given a sufficiently prolonged analysis to meet their needs. And yet they are young enough and plastic enough to be helped. Later, when their earnings may enable them to pay for a psychoanalysis, the damage will have been done. Some of them are drifting toward psychoneuroses and others toward the crystallization of attitudes which will make a satisfactory family life impossible. Since the time for discussion is limited, I will touch upon only one of the important points to be considered when we come to the establishment of psychoanalytic clinics in New York. The problem of training psychoanalysts in sufficient numbers to function in such clinics seem to me to be a very difficult one. I am an objectivist, and not a psychoanalyst, hence my view in the matter may be an unduly prejudiced one. I have come to regard psychoanalysis as a subtle

art and not as a science, and to believe that only men of unusual capacity may safely practice this art. Such men can take Freud's dogmatic say-so's as guides to feeling their way into human situations which call for therapeutic endeavor and thereby achieve brilliant results in many cases. But they are so rare as to be practically negligible for the purposes that we should have in mind in establishing psychoanalytic clinics in New York. If psychoanalysts are to be trained in adequate numbers we must train them to function as technologists rather than as artists, which means that depth of insight must be sacrificed to soundness of tuitional procedure. The technologist must be taught to respect the rules of evidence that are observed in the natural sciences—a fact which has found profitable recognition in all other fields of medicine save in psychiatry. It may be contended, of course, that the psychoanalyst would be unduly hampered in his efforts to express his insights if he were required to respect scientific rules of evidence, but I believe that an unprejudiced examination of the material of psychoanalysis would disclose that from it could be elaborated a body of scientifically valid findings and safe rules for therapeutic procedure which would go a long way toward solving the tuitional problem involved.

You psychoanalysts have had such difficulties in obtaining a fair hearing that you have come to feel that whoever is not wholly and uncritically for you is wholly against you, hence I hasten to assure you that I advocate a revision of psychoanalytic doctrines for tuitional purposes, not because I lack confidence in the skill and capacity of Freud and the handful of American pioneers who have shown their ability to follow him in the practise of a subtle art, but because I believe that out of this art can come a technology which can be acquired by an adequate number of psychiatrists to make possible the realization of Dr. Clark's plan for psychoanalytic clinics.

Mr. Earl F. Zinn (by invitation) said: The large amount of publicity which psychoanalysis has received in this country is precipitating an important problem. Such articles as the one which appeared in the *American Magazine* a short time ago, entitled "How It Feels to Be Psychoanalyzed" is a case in point. In this article the subject was treated in a way to intrigue not only neurotics and psychoneurotics, but that much larger group of individuals whose adjustments are not entirely satisfactory, yet who would not ordinarily consult a psychiatrist. These individuals quite probably would find much in common with the writer. He depicted the outcome of his analysis as quite satisfactory. His health was improved, his earning power increased, and he is now admittedly much happier. None of us would object to a similar experience. My guess is that the article gave a large number of individuals food for thought, if it did not send quite a number to analysts. Incidentally, as indicated by the sequel which appeared in the next number of the magazine, the person who accomplished these wonders for the author was a "lay analyst."

Though this is a rather unusual incident, we have ample indication

of the extent to which the subject is being popularized. Current fiction abounds in allusions, direct and indirect, to the marvels of this new thing. Semi-scientific works on the subject have large sales. Among intelligent people, it is a popular topic of conversation. All this is not without import to psychoanalysis, and those who are seriously interested in its relations to science and medicine. It raises numerous problems, among which not the least important is that of meeting the demand with adequately trained analysts. As the demand for analysis increases, the supply of analysts also increases. Unfortunately there is nothing in the operation of the law of supply and demand which touches the problem of the training and qualifications of the analysts.

Dr. Clark's paper interests me, therefore, from this standpoint. Without attempting to discuss his proposals in detail, it struck me as I listened to him that such a clinic or institute as he suggests would be a beginning, in the development of a systematic program for training analysts under responsible supervision.

But more important even than the training of analysts is provision of facilities for research. Such an institute as is proposed can make its greatest and most lasting contribution if, as it is planned, a prominent place is given to the advancement of knowledge in this field. This means more than provision of facilities for investigation. It means that the spirit of research must be actively fostered. If this is done, it should mark an important advance for psychoanalysis.

Professor E. C. Lindeman (by invitation) said: I have only one comment to make on Dr. Clark's paper, and that is in relation to the second recommendation, or the second implication which leads toward using the proposed clinic for educational purposes. It seems to me, if this could be carried out, it would be the most effective means of bringing psychoanalysis into the stream of the medical sciences; it is very promising to learn that the suggestion comes from the psychoanalysts themselves, for I have great fears, if it had not come from them, that the propagation of psychoanalysis and its theories through a sort of priestly succession would have in the end made it an entirely separatist and external form of therapeutics. I have just one other comment. I stand somewhere between Dr. Hamilton and the psychoanalysts themselves in attitude. I have maintained a critical attitude toward the whole development, but I am reminded that most sciences do start as arts, and the empirical pathway toward scientific verification is by no means the least important; it may be by means of this proposed clinic that scientific discoveries will be made tending to make psychoanalysis verifiable by the general methods of accepted scientific method.

Mrs. Helen M. Ireland (by invitation) said: I am glad to contribute to the discussion upon the need of psychoanalytic clinics the impressions gathered from several years of work in a mental clinic in a small community. The clinic, primarily organized for the benefit of several agencies, has played a threefold part in serving the patients who have been referred to its care. The bulk of the work has

naturally come from such groups as the Organized Charities, the Children's Bureau, the Red Cross and other allied agencies. The patients have been diagnosed on the basis of medical, psychological and social findings and referred to social service with detailed recommendations for treatment. The adjusting of the individual's environment, the rearrangement of the points of pressure and the mental therapy given during repeated clinic calls have often brought most encouraging results. Other demands upon the clinic office have come from the professional and leisure classes who have brought their personal or family problems for discussion or advice. In these cases a mental hygiene society can do no more than act as a clearing house through which such persons are sent to psychiatrists or private sanatoria for which they are amply able to pay. Between these two groups, however, we find a smaller but most appealing set of young people who are so hampered with fears, depressions and hysterical difficulties that they are unable to make good on the jobs which they may have secured by working their way through college or technical schools. Here we find the girl who feels life is so little worth while there is no use in using her more than adequate equipment, the undergraduate whose stuttering defeats all his social and academic aspirations; the young French teacher who is afraid to meet her classes; the eager volunteer whose neuritic right arm prevents the giving of acceptable service. It is this group, packed full of aspirations and possibilities, for which we have the greatest difficulty in securing suitable treatment. Social service in the free clinic offers no opportunity for relief, and the institutions that provide part or full foundation care have such long waiting lists they are unsuited for neuroses that need early treatment. It would seem indeed as if Dr. Clark's paper offers some solution for this difficult type of problem. Psycho-analytic care by lay workers under close medical supervision might well provide the chance of rehabilitation for this group of people who have infinite possibilities, but are leading undeveloped and inadequate lives.

Dr. C. P. Oberndorf said: I would like to talk about the Psycho-analytic Clinic at Berlin. At Bad Homburg, Dr. Eitingon, the director of the clinic, explained the workings in detail to Dr. Clark, Dr. Glueck and myself, and referred frequently to his published reports, issued in 1923 and 1924 and abstracted in the *International Journal of Psycho-Analysis*. Dr. Clark has given you the gist of these reports.

It seemed advisable for me to take the first train to Berlin actually to see this clinic in operation. There are a great many conditions which Dr. Clark has covered which exist at the clinic at Berlin. The free clinic and the didactic clinic, however, are phases of the psycho-analytic movement which are new and vitally important.

The clinic at Berlin is entirely under the direction of the members of the Berlin psychoanalytic society. It is called the Polyclinic of the Berlin Psychoanalytic Society, is registered with the Board of Charities, and has permission from the state authorities to operate. As Dr. Clark said, when the war ended, the need for such clinics was

so acute that the state was quite ready to coöperate with any movement that would help the great number of neurotics then found in Berlin. The clinic owes its success primarily to Dr. Eitingon, who is a wealthy man and who has paid many expenses of the clinic, in addition to giving his time unstintingly.

There are a number of points which Dr. Clark has mentioned which are not quite in accord with the conditions found in Berlin. There is no full time assistant there, but each appointee devotes at least four hours a day to the work. Every member of the Berlin Psychoanalytic Society has agreed to treat at least one clinic patient, either at the clinic or at his private office. The clinic has five rooms constantly in use. The physicians start their analyses at 8 o'clock in the morning, and fresh assistants rotate in these rooms, occupying them three or four hours at a time. Each patient comes at least three times a week, some as many as four or five times, and is under analysis for an hour each time. The patients pay about \$1.25 for the first visit, and thereafter the fee depends on the amount of money the patient can afford. Many are entirely free. In order to enable younger physicians to be trained in this work, Dr. Eitingon personally pays them a small salary to help them while they are learning. The clinic is used for educational purposes. All the physicians must themselves have undergone psychoanalysis before they are permitted to analyze others. A more recent corollary to this requirement is that a physician who has been analyzed must conduct the first analyses under the direction of a more experienced analyst so that the latter can forestall pitfalls into which the novice might stumble.

The therapeutic successes of the clinic are good. They are now conducting about 80 to 90 analyses concurrently. About 200 patients apply for treatment annually, of whom about half are taken. About one-half of the applicants taken stay to complete their analyses. Thirty per cent of the analyses completed are considered successful and about 70 per cent of the cases analyzed are regarded as improved. The success of this clinic has been due to the great sacrifices which all members of the Berlin Psychoanalytic Society, aside from Dr. Eitingon, have made, both financially and in time. Each man, in addition to his personal services, is supposed to contribute 4 per cent of his entire professional income toward the support of this clinic, which is far from being self-supporting.

As for the Congress at Homburg, my impression is that there is very little new in psychoanalytic practice at the present time. Dr. Rank made a comparatively full retraction of his views which he propounded in America two years ago, and Dr. Ferenczi was also somewhat more moderate in regard to his theories of active therapy. The main points which analysts are now investigating are the analysis of the sense of guilt and the ego impulses. In addition, the speakers used such varieties of German enunciation that it was difficult for some of the Germans to understand all of them, and even more so for those of a different mother tongue.

Dr. A. A. Brill said: Dr. Clark's very timely appeal is very

gratifying and let us hope that it will produce some results. I fear, however, that his paper gives the impression that the idea of a psychoanalytic clinic is something altogether new. It is possible that Dr. Clark was not aware of the activities in that direction, notably by some of the members of the New York Psychoanalytic Society. As a matter of fact, we have lectured and worked very hard to bring into operation this very idea. As for its practical application, I feel that a psychoanalytic clinic, independent of a medical school, without the active coöperation of the teachers, could not be a success. For many years I have not only thought of this very subject, but investigated it very thoroughly and I am convinced that such a clinic, especially for the training of physicians, must be connected with some institution for nervous and mental diseases. As I have so often repeated, unless one has a good grounding in neurology and psychiatry, one would hardly be fitted as a psychoanalytic therapist. Of this I am absolutely convinced. To return to the practical side of the problem, I would say that in the first place we need money, money, and more money, and then the coöperation of the teachers of the medical schools. To do analyses in a clinic does not differ in any way from analyses in private practice. The element of time is the same; one must give the patient a certain amount of time. To be sure, I analyzed in clinics when I first began to practice, in New York. I had to get permission from the Vanderbilt Clinic authorities to allow me to meet the patients there in the morning when the clinic was ordinarily closed, and I gave these patients as much time as those in my own office. The importance of the financial problem must be kept in mind; in New York city one could hardly expect that a well trained physician, not independent financially, should give days or even hours of his time to clinical work without being remunerated for it. As Dr. Oberndorf has pointed out, the Berlin Clinic is not only financed by Dr. Eitingon but he as well as a number of the leading analysts give a great deal of their time to the clinics. But there is no doubt at all that in New York city we all would be glad to give our time; we need, however, some philanthropist to cover the financial problem, and last but not least, the coöperation of the doctors. They should realize by this time that psychoanalysis is no longer something to dismiss lightly or to fight over at meetings, we have amply demonstrated its practical application aside from its great influence in the study of nervous and mental mechanisms.

Dr. L. Pierce Clark (closing), said: In my opening remarks, I said I had nothing new or unique to present, but rather the increasing urgency of establishing such clinics warrants its being stated and restated until there is some concerted and definite action taken by the medical profession as well as by lay individuals. As far as the money itself goes, I have not the slightest doubt in my own mind (and I am conservative) that there will be money forthcoming for this work as soon as we have organized ourselves for the work. The second point I am more doubtful about, and that is the average medical school's curriculum approving of the coöordinated activity of such

a clinic. That is the greatest difficulty at this time. If they had not turned down the question so many years ago, there would never have been so many quacks practicing psychoanalysis, and it would be under the control of well trained, careful practitioners.

HYSTERICAL DEPRESSION. A CLINICAL AND PSYCHOANALYTICAL APPROACH

DR. DORIAN FEIGENBAUM (by invitation)

Very colorful material was brought out during a psychoanalysis lasting about seven months in a case of an atypical combination of conversion hysteria and depression. The patient is a twenty-four-year-old girl, a dressmaker. Her neurosis broke out immediately after her brother's death, at twenty-seven, of cancer of the stomach. The patient nursed him during his sickness, which lasted eighteen months. She came up for analysis one year after the outbreak of the neurosis. During the psychoanalytical treatment the following symptoms were observed:

The patient was in a depressive state characterized by a self-centered mood, lack of interest in her surroundings, tense expression, sluggish gait and speech, inclination to cry, pessimistic ideas centering around the notion of death, and a great variety of hypochondriacal fears and complaints. She feared that she was affected by a very serious sickness known to her, *e.g.*, ulcer of the stomach, ulcer of the brain, rheumatism, gallstones, anemia and cancer. Cancer was the most persistent fear. Loss of appetite and pseudo-hunger, distaste of oil, butter, fat, etc.; "fullness" in throat, stomach and intestines; nausea and constipation, pressure, congestion in her breast and difficulty in breathing. "I can't breathe," she complained, while resting quietly and speaking in a normal, even way,— "it takes my breath away." For more than one year, as the history showed, she actually suffered from *fluor albus*. This stopped after six weeks of the analysis. Spells of spasms at night and occasional headaches complete the list. Most of her pains the patient localized in her left side. She was a victim of a number of compulsive fears ("of falling," "of fainting," "of being raped," "of drinking," "of bathing," "of cessation of menses," etc.); compulsive ideas ("pus in my mouth and throat," "I have dirt in my body," "I have bad imaginations," a kind of compulsive macropsy and "conglomeropsy"; she was compelled "to see several things conglomerated into one thing," "to see the colors perverted," *i.e.*, "green for red," etc.); and compulsive acts ("to examine and wash the mouth and throat several times a day for months," "to fill up my throat with water," "just to open my mouth," a compulsive bed ceremony, etc.). All these symptoms may be gathered under the head of conversion hysteria, depression, and a compulsive syndrome. Besides are to be noted visual hallucinations, observed exclusively in the first period of the analysis, *viz.*: "I saw a malicious woman," "a man in navy blue," "a girl in black, she cries," "small round green stones," "dead bodies," "pictures," "a man seducing a girl," "fire," etc.

The analysis was able to unfold the unconscious relations of almost all the symptoms which are based upon the patient's latent conflicts of the past as well as on the recent ones. Father-brother fixation and mother complex are in the center of her conflicts. Brother's death and a recent loss of a lover—because of the interference of a neighbor (“a malicious woman” or “that woman” in dreams and hallucinations)—provoked a latent neurosis of her childhood. As the fifth child in the family of six, from her earliest childhood she was under a continuous impression that in the family preference was given to the others, and thought that she was taken advantage of by her mother and her oldest brother. She definitely preferred her father and the younger of her brothers. She slept in one bed with father or older brother up to the age of about twelve. One night, when she was nine years old, her brother kept her tight in his arms; she awoke with anxiety and later refused to sleep with him again. “That night I saw the difference between men and girls,” she reports. This traumatic experience contributing to her primary sex-envy forms the patient's castration worry. Discontinuance of her libidinous father investments of early childhood, active tendencies of castration (later resentments against mother and mother images) and identification with men are the after effects. The younger brother she identifies with the father. He brought her to America, married off her younger sister and was vitally interested in marrying her off, when he took sick. During his sickness she nursed him and slept with him many nights “in order to be with him whenever he wanted her.” (She always slept at his right side so that she felt him at her left side; the left side becomes to her a symbol of sickness and death.) Shortly before his death the patient through an open door heard her brother saying to a friend: “I can't be saved any more; but she is to be saved.” “I could not get what he meant” (the patient reports), “what was I to be saved from? I did not feel sick at all. I was afraid he had become insane.” (We trace here the “postponed obedience” which I believe to be in this case the leading factor in the neurosis and its fate.) Her first menstruation, at the age of twelve, was a critical period for her. For several months she kept it a secret from her mother, probably because of the previous shock that she experienced in connection with blood and mother (a hemorrhage of the lips, which her mother laughed at, is a subject of continuous reproach towards mother “who neglected my whole life”) as well as because of an accident, a vaginal hemorrhage, which she had witnessed in a friend. Her resentment against mother rose to its height when, at the age of sixteen, the mother interfered with her first love affair.

The patient has a very rich dreamlife. The psychoanalytical work proceeded along the analysis of more than 150 of her dreams. Most of them were centered around her brother identification, mother complex and the castration conflict. Brother appears as her beloved, with whom she desires to be in relation, regardless of the fact that he is dead. “Death” means to the dreamer's unconscious “death in love.” Many of her dreams are typical exhibitionistic one. Be-

sides the patient brings a great many cannibalistic dreams. The analysis of the latter enabled an understanding of most of her oral and digestive symptoms and revealed the mechanism of introjection. The analysis proceeded most of the time by positive transference. The analyst was the missed brother. Periodically her negative disposition towards her mother was transferred. The patient's resistance was treated by virtue of her mother dreams.

The following conclusions are made:

The outbreak of the psychoneurosis follows the brother's death and the recent loss of her lover because they symbolize to her a new experience of castration. Have we a typical case of depression before us? No. Because there are absent in this case the typical depressive inhibition and the typical impoverishment of the ego. We miss an exclusive regression of the libido to narcissistic positions. Is the patient's grief after her brother a melancholic grief? No. Freud's classic words, "In grief the world is poor and empty. In melancholia the ego is poor and empty," do not allow us to call this grief melancholic. The kaleidoscope of the conversion hysterical symptoms is also strange to a typical depression. On the other hand, we notice depressive elements, compulsive and hypochondriacal symptoms. The case is an atypical combination of psychoneurosis with attributes of psychosis. The "postponed obedience" to a certain extent enables us to understand why this case did not become a psychosis. According to the dying brother's words, the patient had to become sick; she had to be saved. We see the brother's words serving as a command to her neurosis and at the same time giving her the ability to transfer which saved her from deeper regressions.

The patient now works in a shop and is sociable, though not yet amenable to mixing with new friends. She plans to go eventually to her mother and the rest of her family in Europe.

Discussion: Dr. A. A. Brill said: It is to be regretted that Dr. Feigenbaum could not give the whole analysis because of the lateness of the hour. Judging by the charts he has given, I can see that it is a very interesting and very well organized analysis. We are really dealing with a case of psychoneurosis having a very pronounced schizoid background. In any case it makes little difference what we call it, the analysis proceeds in the same way, and judging by what we heard from Dr. Feigenbaum and from my perusal of his charts, I feel that he has presented to us a very interesting case, and regret that he could not give us all the details of his material.

Dr. Feigenbaum (closing) said: Dr. Brill was able to guess the structure of the psychoneurosis from the charts, without knowing much of the case, as I was not able to fully represent it for lack of time. The first chart represents the patient's latent inner conflict from her childhood until the outbreak of the neuroses. Due to specific shocks in connection with her mother the primary Oedipus conflict got a considerable power. Persons, regardless of sex, who treat her ill, as she believes, are her mother images, and anger and resentment towards mother are transferred to them. You see such mother images: the oldest brother and the younger sister (as from

the etiological series) and one brother-in-law, "that woman," her manager in the shop and later on in the treatment the analyst (as from the symptomatic series). The objects of her first libidinous investments are: father and her brother that brought her to America. Here again, early in her childhood the patient experienced serious shocks which caused her an increase of the castration complex and identification with men as father-brother images. Withdrawal of libido from her first investments as well as resentments towards mother (active castration tendencies) fall into suppression and form here a latent neurosis. The second chart represents the establishment of the psychoneurosis provoked by two incidents: death of brother and loss of her lover. A new fatal deprivation of libido means to her an irritation of the castration worry which now urges her to find an outlet. She fails to find it in the reality and the result is regression of the libido into infantile, partly narcissistic stages, that is, negation of the reality ("brother is not dead"—"I did not lose my beloved") and reestablishment of previous investments. This is for the patient her "morbid gain." This morbid gain is outweighed by the symptoms as self-punishment, and follows besides the "postponed obedience."

I call it a case of hysterical depression because there are in the foreground present conversion hysteria plus a hypochondriacal depression. Coming across the mechanism of introjection Dr. Brill is justified in thinking of schizophrenia. This, of course, is of narcissistic nature. But I cannot diagnose the case as such a schizophrenia because of the following reasons: The patient has no delusions and her grief after her brother is not psychotic (we may call it a pseudo-melancholic grief). Conversion hysteria appears in the center of the psychoneurosis and is not a concomitant. The hallucinations are of hysterical quality. For hysterical depression, finally, plead her insight into the disease and will for recovery—her good transference and—the cure.

CURRENT LITERATURE

I. VEGETATIVE NEUROLOGY.

1. VEGETATIVE NERVOUS SYSTEM.

Stahl, S. FOCAL SKIN REACTIONS AND VEGETATIVE NERVOUS SYSTEM. [Kl. Wschr., Vol. II, No. 22.]

Stahl points out two factors to which he attributes the focal reactions which occur in therapy by stimulation and baths. He finds through observation and experiment that there is first an increased local stimulability in the focus of disease as compared with other body cells and second that the therapy produces an increase in vagotonus which reveals itself especially in the disease foci because of their increased sensitivity.

Toenniesen, E. VEGETATIVE NERVOUS SYSTEM AND REGULATION OF TEMPERATURE AND METABOLISM. [Ergb. d. inn. Med. u. Kinderhkl., Vol. XXIII, pp. 141-233.]

In this interesting paper the author discusses in detail the relation of the regulation of temperature and of metabolism by means of the vegetative nervous system and the internal secretions. While the cerebrum controls the relations of the individual to the external world as far as regards conscious motor and sensory functions the vegetative nervous system is the central regulating organ for unconscious processes. These are no less to be considered as purposeful life processes regulated for the maintenance of the individual and the race. With the ancient philosophers he believes that one may speak of a "vegetative intelligence." This regulation is most highly developed in man and in him the blood is in the most complete state of equilibrium physically and chemically. In contrast to this the phylogenetically more recent cerebral functions (intelligence, will, etc.) are much less uniformly developed and much less stabilized.

The author speaks more specifically of the synaptic foci (centers) in the diencephalon and the medulla oblongata, with their peripheral tracts and end organs as almost exclusively the centers for the regulation of temperature and metabolism. The stimuli which act upon these centers to produce fever are chiefly substances of bacterial origin, furthermore products of albumin decomposition within the body and still more rarely mechanical causes such as pressure from tumor. Increase of temperature results from the strengthening of the sympathetic impulses from the heat centers to the internal organs, especially to the liver, by which

means oxidation is increased. Thus increase of oxidation is the primary symptom, the increased temperature a secondary one. This increase in combustion brought about through the vegetative nervous system differs from that due to cerebrospinal innervation in the fact that it affects chiefly the decomposition of albumin.

Abadie, C. PATHOLOGY OF THE SYMPATHETIC SYSTEM. [Presse Méd., June 6, 1923.]

Glaucoma is not a disease of the eye but of the sympathetic nerve innervating the vessels of the eye. This was the form of statement made by the author in 1897. Following this in his article he says he stated: "Probably along the whole chain of the sympathetic system, disturbances in the innervation of the vessels are liable to induce pathologic conditions in certain organs and viscera. These pathologic conditions are illogically ascribed to the organ itself, when in reality they are secondary to the primary disturbance in the nerve supply." Time has confirmed the correctness of this view. Periarterial sympathectomies in treatment of causalgia, mal perforant, Raynaud's disease, and angina pectoris are interesting surgical experiments and bring the vegetative nervous system into increased importance. Periarterial sympathectomy might correct the abnormal conditions in the kidney and arrest the syndrome as in angina pectoris.

Orator, V. NEW VIEWPOINTS IN TESTING ACTION OF DRUGS. [Mitt. a. d. Grenz. d. Med. u. Chir., XXXVI, 151-440.]

Orator's summaries of the clinical picture and response in sixty-three patients demonstrate that most persons react to pilocarpin and to epinephrin in the same way, vigorously or weakly to both. The thyroid controls the reaction.

Daniélopou, D. THE VEGETATIVE SYSTEM. [Presse Méd., July 25, 1923. J. A. M. A.]

Daniélopou reports the results of recent research which apparently establish that the balance between the sympathetic and the parasympathetic innervation of each organ is determined in the organ itself, not in the nervous centers. The balance may be upset by a lesion in the afferent nerve tracts, by a lesion in the organ itself, or by a general excitability or lack of excitability in the sympathetic or parasympathetic, or in both [or by psychical situations, Ed.]. Variable compression of the eyeball induces a number of visceral reflexes, as does compression of the vagus in the neck, which throw light on the factors involved. Tests with drugs, recording the effect on the contracting force of the heart, bladder, stomach, and other viscera by methods he has worked out, give some insight into the functioning of the vegetative nervous system. He claims that the methods he describes, especially his application of Marey's principle of manometer estimation of the contractile force of the viscera,

from within, allow hitherto unattainable precision in such tests. He insists that drugs for these tests must never be injected subcutaneously; the intravenous route is indispensable. He gives the findings and charts from cases of each type of vegetative disturbance.

Daniélopou, D. NORMAL TONUS OF VEGETATIVE NERVOUS SYSTEM. [Bol. Med., Aug. 25, 1923.]

This issue of the *Bulletin* contains a summary of Daniélopou's survey of the vegetative nervous system.

Kessel, L., and Hyman, H. T. AUTONOMIC IMBALANCE. [Am. Jl. of Med. Sc., April, 1923; J. A. M. A.]

A study of the clinical manifestations of autonomic imbalance is presented by Kessel and Hyman. The symptoms are strikingly similar to those in exophthalmic goiter. In autonomic imbalance there is never a distinct and continuous elevation of the basal metabolism. This serves as a crucial differential point from exophthalmic goiter. Autonomic imbalance can rarely be arrested permanently. Usually the symptoms may be alleviated, but the diathesis persists.

Escudero, P. PILOCARPIN AND VEGETATIVE NERVOUS SYSTEM. [Endocrinology, Mar., 1923.]

This pharmacodynamic study tends to show that pilocarpin acts on both sections of the nerve system. Increased salivary secretion through parasympathetic and sweating through sympathetic stimuli. Sweating provoked by the injection of 0.01 gm. pilocarpin is not necessarily proof of parasympathetic innervation. Parasympathetic irritability must be examined by injecting only 2 mg. pilocarpin; it is considered increased when this dose provokes 50 c.c. or more salivary secretion. Subcutaneous injection of 0.001 gm. atropin does not modify the pulse rate in normal cases. An increase of pulse rate from 10 to 40 per minute is observed in cases of diminished vagus tone. Paradoxical reaction is evidenced in cases of vagotonia.

Holzknacht, G. ALLEGED STIMULATING ACTION OF ROENTGEN RAYS. [Münch. med. Woch., June 15, 1923.]

Pharmacologists and others have been quoting what has been termed the Arndt-Schulz law, which states that small amounts of a stimulus have a stimulating action, moderate doses paralyze, and large doses kill. In this paper the author applying the principle to the roentgen rays, states that they never have a stimulating action, no matter how small the dose.

Böwing, H. VEGETATIVE FUNCTIONS OF THE SKIN. [D. Zschr. f. Nervhkl., LXXVI, Nos. 5, 6.]

Böwing cannot accept as the sole cause for trophic disturbances of the skin of the subcutaneous cell tissue and of the bones the loss of pro-

tection due to abolition of sensibility. Neurogenic dystrophies in injuries of the peripheral nerves apparently originate because of interruption or of a stimulated condition of special trophic fibers. The trophic fibers seem in part to run together with the sensory peripheral nerves, in part to join themselves to the nerves that follow the blood vessels. One may explain the appearance of neurogenic dystrophies in tabes, syringomyelia, scleroderma and in injuries of the spinal cord through the pathological stimulus or through the affection of the trophic centers in the spinal cord. In paraplegias disturbances of circulation, changes in the elasticity of the skin and in the condition of the nails, hypertrichosis, cystitis and pressure tumors in the affected areas may be observed as results of trophic losses and stimuli. It would seem from the appearance of skin dystrophies after injuries to the brain that the trophic centers are to be found in the brain. Böwing points out the significance for his subject of the anatomical findings in a case of hemiplegia with marked dystrophies. Injuries of the internal capsule, of the putamen, and the globus pallidus, also of the thalamus and the corpus subthalamicum were visible.

Wise, Fred. ACRODERMATITIS CHRONICA ATROPHICANS AND ITS RELATION TO SCLERODERMA. [N. Y. Med. J., July 18, 1923.]

This article is a sequel to four preceding papers by the author, dealing with acrodermatitis chronica atrophicans. In the former papers were discussed the clinical, histopathological and diagnostic features of the disease. The present paper deals with the sclerotic manifestations appearing in some cases of acrodermatitis atrophicans. These areas of sclerotic skin have been erroneously diagnosed scleroderma by physicians who have not had opportunities to see a sufficient number of cases to become thoroughly acquainted with the disease as a whole, in its various and diverse manifestations. Wise shows that there can be no relation between acrodermatitis atrophicans and scleroderma, since the former is essentially an atrophying dermatitis, while the latter is essentially a sclerosing process—two diametrically opposed pathological processes. He shows that the sclerotic areas of the disease invariably appear in skin which had already undergone the process of atrophy, and that the scleroses are always secondary manifestations with reference to the atrophying dermatitis, not primarily, as they might be if they were true scleroderma. Furthermore, the author emphasizes the fact that there are cases of long-standing acrodermatitis atrophicans in which sclerotic tissue is "conspicuous by its absence." Hence the assumption that "probably all cases of acrodermatitis atrophicans are merely forms of scleroderma," must necessarily be an erroneous one; he cites cases of typical acrodermatitis atrophicans of over fifteen years duration, in which sclerotic tissue never became manifest during the entire course of the disease. The fact that scleroderma sometimes terminates in atrophy does not point to any

relationship to acrodermatitis atrophicans, since other non-related diseases such as syphilis, leprosy, pityriasis rubra of Hebra and favus, may also terminate in atrophy and anetoderma, without in any way bearing any relationship to scleroderma.

The author supports his arguments by studies of the histopathological structure of the scleroses of acrodermatitis atrophicans, showing that the pathological alterations in these differ from that of true scleroderma, and therefore should not be mistaken for scleroderma in any of its clinical phases. [Author's Abstract.]

2. ENDOCRINOPATHIES.

Lisser, H. ABSENCE OF THE PROSTATE ASSOCIATED WITH ENDOCRINE DISEASE. [California State Journal of Medicine, December, 1922.]

Whether the prostate deserves to be classified among the incretory glands is as yet extremely problematical. DuBois and Boulet in 1919 demonstrated that intravenous injections of extracts of normal prostate cause a contraction of the bladder, whereas hypertrophied human prostate had no such effect. They concluded that there is an internal secretion of the prostate which acts as an excitant of the vesicle muscles. Macht reported that the feeding of prostate hastens metamorphosis of the frog and salamander larvæ, but that unlike thyroid it causes no shrinkage of the animals. In 1775 John Hunter called attention to the fact that castration carried out in youth or infancy causes hypoplasia or want of development of the prostate. About a century later Griffiths, White and Guyon added the interesting fact that castration in adult life causes atrophy of the prostate.

The Froehlich syndrome discovered in 1901 consists of skeletal undergrowth, obesity, and sex infantilism; the Lorain type likewise demonstrates skeletal undergrowth and sexual aplasia, but *without* adiposity; the Neurath-Cushing variety of dyspituitarism consists of skeletal *over*-growth *with* adiposity and sexual infantilism; the common denominator in these clinical disturbances is sexual infantilism. Goetsch found that feeding of pituitary anterior lobe extracts to young rats caused more vigorous body growth than in the control animals and stimulated earlier and more active genital development. In his report he specifically mentions the effect of anterior lobe feeding on the prostate gland which showed, like the sex glands, an earlier development and activity. Many investigators (notably Crowe, Cushing and Homans, Blair-Bell, and Aschner) proved by producing hypopituitarism experimentally that the genital apparatus is markedly retarded in its development and that this hypoplasia included the prostate as well as the testes, penis and vas deferens.

In view of the striking genital abnormalities repeatedly emphasized in *clinical* hypopituitarism, and in view of the specific mention of undeveloped prostates in *experimental* hypopituitarism, it seemed rather sur-

prising that no reference to the prostate had been made in the innumerable case reports of Froehlich, Lorain, and Neurath-Cushing hypopituitarism. Accordingly, in 1920, I placed on record (The New York Medical Journal, March 2, 1920) five cases of pre-adolescent hypopituitarism, in three of whom *no prostate* could be felt by rectal examination, and in two of whom only a very tiny diminutive organ could be recognized. Since that publication several more cases have been discovered so that to date there may be reported fifteen cases of hypopituitarism (eight of the Lorain type, five of the Froelich syndrome and two of the Neurath-Cushing type) and three cases of primary gonad deficiency. Of the eighteen cases no prostate could be felt in thirteen cases and only a tiny diminutive organ in the remaining five. Not much is to be gained at this time by elaborating theories concerning absent or diminutive prostate in hypopituitarism. It is established that atrophy occurs after castration; we also know that testicular aplasia occurs in hypopituitarism. Whether the prostatic aplasia or atrophy in hypopituitarism is due directly to the lack of pituitary secretion or whether it follows upon testicular insufficiency is difficult to decide. As it happens, all the cases that show absent or diminutive prostates likewise show tiny and insufficient testes. [Author's abstract.]

Ludwig, F. FUNCTIONAL TREATMENT OF DYSMENORRHEA. [Schweiz. med. Woch., Dec. 28, 1922, LII, No. 49-50.]

Ludwig surveys the theories, and accepts dysmenorrhea as a disturbance of the tonus of the uterus. Substances paralyzing the tonus have a favorable influence.

Sternberg, C. ON THE OCCURRENCE AND SIGNIFICANCE OF THE INTERSTITIAL CELLS. [Beitr. z. path. Anat. u. z. allg. Path., 1022, LXIX, 262.]

The question of the occurrence and significance of the interstitial cells still awaits a definite solution. The only points which have been so far ascertained regard the internal secretory function of these cells and their influence on secondary sexual characteristics. But only further investigations will show how far they act as trophic organs during spermatogenesis and regeneration of seminiferous tubules, and what influence they have on the compensatory proliferations through which degenerated testicular parenchyma is replaced. [Da Fano, Med. Sc.]

Apert, Stevenin and Broca. HIRSUTISM IN A BOY. [Bul. d. l. Soc. Méd. d. Hôp., Dec. 22, 1922, XLVI, No. 37.]

A clinical report of a case of extreme hirsutism in a twelve year old boy, of adult mentality, grown up cardiovascular responses, and adult basal metabolism figures. He was fat and small, pituitary treatment was without results, further increase in weight resulting. Thyroid feeding seemed to promise something.

Haberland, H. F. O. CLINICAL SIGNIFICANCE OF EXPERIMENTS ON TESTES. [Klin. Woch., Jan. 22, 1923, II, No. 4.]

Fifty-six testis grafts in animals are here reported on. Permanent survival of transplanted testes, even when taken from the same animal, were unsuccessful. The favorable results reported in men he believes may be interpreted on purely psychogenic grounds. (This seems to be the valid explanation for much of this type of therapy.)

Lipschutz, A. NEW EXPERIMENTAL DATA ON QUESTION OF SEAT OF ENDOCRINE FUNCTION OF TESTICLE. [Endocrinology, VII, No. 1. J. A. M. A.]

Lipschutz presents a review of the experiments performed by himself and his co-workers on the interstitial cells of the mammalian testis. Various data are adduced which have not been published previously. It is held that a normal condition of hormonal activity of the testis of mammals is not possible without fully developed interstitial cells. A testis with spermatozoa, but with underdeveloped interstitial cells, cannot perform its normal endocrine function. Completion of spermatogenesis is not necessary for the performance of the endocrine function. Normal endocrine function is possible even when no other generative cells than the cells of Sertoli and spermatogonia are present in the tubules. The hypertrophy of the remaining testis in unilateral castration is not compensatory since small testicular fragments do not hypertrophy and, furthermore, the sex characters can be developed normally when a fragment of only about 1 per cent is present in the body. The increase of the generative tissue in the testis after unilateral castration has nothing to do with the endocrine function of the testis. It is highly probable that the interstitial cells are producers of sexual hormones; it may be that in extrauterine life they receive some impulse from the developing generative cells, like the granulosa and the theca interna of the ovary.

Williams, W. L. SOME PHASES OF BOVINE GENITAL INFECTIONS OF POSSIBLE INTEREST TO THE MEDICAL PROFESSION. [American Journal of Obstetrics and Gynecology, IV, No. 5.]

The author maintains that cattle offer, in many important respects, unusual opportunities for the study of the general principles of the physiology and pathology of reproduction applicable to all mammalia. Healthy cattle of all ages and both sexes, including non-pregnant and pregnant females, are slaughtered for food in vast numbers and their genital organs are available for study immediately after death from bleeding. The internal genital organs of cattle are more conveniently and accurately palpable per rectum than in any other mammal. There is no social stigma attached to genital diseases of domestic animals so that they may be studied more openly as purely scientific and economic problems. The estrual-ovulation cycle in the cow is brief, definite and clear, the ripe ovisac, the crater after its rupture and the corpus luteum are readily

palpable, menstruation is definite and the relationship between these phenomena are clearly traceable. Cattle breeding is based upon a controlled polygamy which offers an opportunity for a study of the influence of coitus upon the sexual soundness of the male, and furnishes clinical data upon the problem of sexual excess.

Examinations of cows slaughtered when about to abort or which have just aborted, thus far show that in all cases abortion is due to a severe cervical endometritis while the ovarian end of the uterus remains comparatively healthy, and able to contract upon, and expel, its contents. In other instances the metritis involves the ovarian end of or the entire endometrium; it does not cause abortion but instead leads to retention and maceration of the fetus (the "missed abortion" of gynecologists). Since the cervical endometritis constitutes the basic lesion of abortion in cattle (and other domestic animals) it suggests that the principle applies only to woman and that such elements as food, physical injury, intercurrent acute infections serve only to intensify the basic lesion and precipitate a disaster which might otherwise be averted.

Obstetrists and gynecologists view the genital infections of woman (except syphilis and gonorrhea) as being in a way peculiar to the female. In cattle the polygamous breeding enables the veterinarian to observe clinically that the male frequently transmits to his group of females important genital infections which lead to cervicitis, metritis, salpingitis, placentitis, sterility and abortion. The infectiousness of the bull may be further verified by physical examination, by post-mortem, histological and bacteriological findings, and especially, clinically, by fixing and staining the spermatozoa so they may be studied in detail for aberrations in form and structure. Observations upon bulls enable the veterinarian to reach a concrete conception of what constitutes sexual excess. It appears that as the frequency of coitus advances, the fertility decreases, owing, it seems, to intensification of the infections present in the testes, epididymes, seminal vesicles and other structures. The author therefore concludes that a study of the physiology and pathology of reproduction in cattle may yield important facts regarding basic laws applicable to the sex problems of the human family. [Author's abstract.]

Lintz, W., and Markow, H. RELATION OF ONSET OF MENSTRUATION AND ENVIRONMENT. [Endocrinology, VII, No. 1.]

According to the studies made by these authors, regardless of the size of the town or city, the nature of the environment, the character of the economic status or the kind of occupation, the average age at onset of menstruation remains approximately the same—between thirteen and fourteen years on the average.

Harvey, W. G. CASE OF PRECOCIOUS SEXUAL DEVELOPMENT. [Irish J. of Med. Science, V, No. 12.]

This clinical report records menstrual onset at the age of twenty-one months. At two and one-half years she had menstruated nine months.

She was small and thin, normal in her mental development for her age. She had well developed breasts, a tense and swollen abdomen, a coarse growth of dark hair on the pubes, and adult external genitalia. The swelling and tenseness of the abdomen was due to a large tumor involving the kidney and suprarenal. She died at thirty-one months of age. The thymus was practically nonexistent, and the left ovary was cystic, while the right kidney showed hypertrophy. The tumor was a very cellular and vascular sarcoma; its primary origin was not determined.

II. SENSORI-MOTOR NEUROLOGY.

1. CRANIAL NERVES.

Fields, S. O. VESTIBULAR DESTRUCTION WITH ONLY SLIGHT COCHLEAR INVOLVEMENT. [Laryngoscope, January, 1923.]

This article begins by drawing attention to the late war as a by no means inconsiderable factor in upsetting many of the pet theories generally held by medicine, and by otology in particular. From the otologist's point of view, in the light of war experiences, a revision or revamping of much that was formerly accepted without question is necessary. And no question is probably more interesting than the problem of aural affections and their relationship to aerial concussion and to direct cranial injury.

Formerly it was stated that the essential difference between aural lesions due to concussion and those due to direct injury was the presence of a bloody or serous discharge in the latter and its absence in the former; but now it is known that the difference is the rarity of absolute and permanent deafness, with only exceptional vestibular involvement, in concussion injuries, while direct injuries show pronounced auditory manifestations with coincident vestibular derangement. Another exploded belief is the one that the rupture of the drum which often occurred in these cases was indicative of extreme gravity; but in cases studied during the world war (and even prior to that time) it was found that cases with ruptured drums recovered with less damage to the internal ear than cases with absence of rupture—a circumstance perhaps explainable by the fact that a certain portion of the traumatic force is absorbed in producing the solution of continuity in the drum membrane.

A consideration of the pathologic features in both concussion injuries and direct lesions reflects the general uncertainty by which the whole subject is characterized. As a result mainly of animal experimentation there have been noted in concussion lesions: atrophy and destruction of Corti's organ; atrophy of the spiral ganglion cells; dislocation of the scala media; transudations and minute hemorrhages in the scala tympani; occasionally, destructive changes in the fibers of the cochlear nerve; and always noninvolvement of the vestibular apparatus. In direct lesions

there have been seen: either minute direct or extension fractures of the labyrinth capsule; some observers postulate a basic violent molecular vibration and commotion; others describe a rupture of the minute labyrinthine vessels or a laceration of the nerve endings. All authorities agree, however, that in the lesions due to direct injury auditory disturbances are always more pronounced than vestibular disturbances (where both coexist).

As an exception to this universal rule the author cites a case referred to him by the attending physician.

A colored laborer of twenty-three years was struck on the right side of the head, in the region of the mastoid, with a heavy hammer, and was unconscious for about three hours. The author saw him three weeks afterward. There was no discharge or hemorrhage from the ear following the accident. The patient stayed in bed about two weeks chiefly because of an annoying and persistent vertigo which set in shortly after regaining consciousness. Objects also seem to revolve around him, and he experiences a moderate amount of auditory impairment for whispered speech, and also tinnitus.

Nothing of interest in the past medical or family histories, or general physical examination. Blood Wassermann, negative. The left ear is normal.

The right ear shows scarring of the auricle and of the mastoid region. X-ray, negative. Drum, normal. Vestibular tests show an entire absence of irritability, both on rotation and hot water irrigation, and no spontaneous nystagmus was seen. Auditory tests show only a moderate amount of the involvement characteristic of perceptive apparatus affections, and even this slight amount showed gradual and almost imperceptible improvement until the last visit showed nearly normal hearing. The vestibular apparatus never at any time showed any departure from the original findings. The patient was allowed to return to work after he had learned to compensate for his deranged vestibular function. Clearly in this case the traumatic factor expended the major portion of its force on the static portion of the labyrinth, and the cochlear portion was only slightly affected, as indicated by the moderate amount of auditory involvement and its progressive improvement. The author is satisfied merely to set forth the facts and makes no attempt to wander afield into the realm of speculation. [Author's abstract.]

Bruce, A. Ninian. FACIAL TETANUS. [Rev. of Neurol. and Psych., Vol. XVII, Nos. 4, 5, 6.]

Thirteen months after wounds by a shell explosion, the onset of tetanus developed with "terrific" pain on one side of the face, swelling of the throat, inability to expectorate, and severe headache. Heat gave some relief. The pain, however, did not subside until the fifth day. Six months later the mouth was still firmly shut but could be opened with

difficulty. The left masseter was stiff and tense. The symptoms cleared up rapidly following subcutaneous injections of anti-tetanic serum. [Atwood.]

Bab, M. INVOLVEMENT OF THE AUDITORY NERVE IN EARLY SYPHILIS. [Deut. med. Woch., Feb. 16, 1923, p. 218; B. M. J.]

M. Bab has carried out investigations with a view to checking the claims of Alexander, Kobrak, and others, according to whom the auditory nerve is often implicated before the appearance of secondary signs of syphilis. The author examined twenty-six cases of primary syphilis in which the diagnosis was confirmed by microscopic examination. On the same day on which this examination was made the patients were sent to a specialist in aural diseases for him to say whether they had symptoms of ear disease or not. On the same day or on the following day abortive treatment with neosalvarsan was instituted. The report of the aural specialist showed that in about 75 per cent the auditory nerve was already involved, and this was as often the case when the Wassermann reaction was negative as when it was positive. In most cases with signs of disease of the auditory nerve there were no subjective symptoms, but the signs were so characteristic that they may possibly prove of considerable value in the clinical diagnosis of doubtful cases of syphilis—for example, cases of mixed infection in which it is impossible to demonstrate the *Spirochaeta pallida*. In 70 per cent the abortive treatment of these twenty-six cases was successful; six to eighteen months later there was no clinical or serological evidence of syphilis. In those cases in which there were no signs of involvement of the auditory nerve when the abortive treatment was instituted, it was invariably successful. It would seem that the injury to the auditory nerves caused by syphilis takes long to repair, and it may be demonstrable after the patient appears to have recovered in other respects from syphilis.

Allen, Orris T. VERTIGO. [Ill. Med. Jl., September, 1922.]

Vertigo always results when there is a contradiction between the nervous impulses from the semicircular canals and the position of the body as indicated by other sense organs.

Perfect equilibrium is accomplished through the harmonious action of three nerve tracts: (1) Vestibulo-ocular; (2) vestibulo-spinal; (3) vestibulo-cerebellar. Of these the first is of least importance in the maintenance of equilibrium. Complete loss of function of the vestibulo-ocular tract does not produce vertigo. It is only a false sensation received through this tract that causes vertigo. If the vestibulo-spinal tract fails to function, the patient usually is able, after a short time, to compensate for the loss, and maintains equilibrium with the other two. But never with one. The vertigo that is continuous for two or three weeks and then disappears is most likely due to a labyrinth lesion, as in these cases compensation is established in about three weeks.

If transient and extends over several months, think of toxemia or the circulatory system. If continuous and lasts several months a cranial lesion is suggested.

Classification

1. Ocular (due to faulty action of eye muscles).
2. Cardiovascular (ischemia or congestion—cranial).
3. Toxic (action of toxins on the normal labyrinth).
4. Labyrinth (lesion of or pressure on drum).
5. Cranial (lesion of cranial pathways).

In most instances a good history and a thorough physical examination will clear up the case sufficiently to enable us to place it in one of the above classes. If not, we may resort to the Bárány tests. If all responses to the Bárány are normal we have narrowed the diagnosis to:

1. A functional neurosis.
2. An ocular disturbance (not paralysis).
3. An evanescent toxemia. [Author's abstract.]

Gerstenberger, H. J., and Dodge, C. T. J. LIGHT IN TREATMENT OF OTITIS MEDIA. [Am. Journ. of Dis. of Child., XXIV, No. 4. J. A. M. A.]

Gerstenberger and Dodge are convinced that without question radiant heat in the form of light (quartz-mercury arc ultraviolet ray) is a therapeutic measure of great value, which will be found useful not only in the treatment of otitis media in its various forms but also in other conditions in which the therapeutic effectiveness of an active hyperemia is desired. This belief is based on clinical observation.

Wells, W. A. A NEW AND SIMPLE METHOD OF DETECTING FEIGNED UNILATERAL DEAFNESS. [Journal A. M. A., July 21, 1923.]

This test is based on a well-established acoustic principle, viz., that when the two ears are simultaneously exposed to sounds of identical pitch and quality, but of different intensity, the sound is invariably referred to the side of greater intensity. The paraphernalia used for the test is a piece of rubber tubing of one-fourth inch caliber, from 20 to 30 inches in length, and of a firmness to insure good conduction of sound. In one end of the tube is an ear-piece that fits well into the auditory meatus, while in the other end we insert the stem of a long sounding fork of low pitch (about 126 vibrations a second) and of good amplitude. When the apparatus is used on a person with normal hearing, should one end of the tube be placed, for example, in the right ear, and then the fork caused to vibrate within the usual hearing distance of the left ear, there will be no conscious perception of sound in the latter situation. In accordance with the acoustic principle enunciated, it is all referred to the right side because of the greater intensity due to direct conduction of the sound waves through the tube to the meatus. Applied to the case

of the malingerer, the value of the test lies in the fact that with the intensified sound in the alleged deaf ear one is deprived of the power of recognizing the weaker sound in the good ear, which is not true in the case of real deafness, and is therefore a proof of simulation.

Ribón, V. MECHANISM OF HEARING. [Rep. d. Med. y Cir., XIII, No. 10.]

This paper summarizes the various hypotheses in vogue to explain the mechanism of hearing and the musical sense, emphasizing the psychologic element, and that the organ of hearing has not yet reached its full evolution.

Neumann. TONE AND RHYTHM. [Spanish Letter, J. A. M. A., March 3, 1923.]

In an interesting lecture before the National Academy of Medicine, Neumann of Vienna recently discussed the physiologic relationship between the static and the acoustic portions of the internal ear, which, in his opinion, parallel the anatomic relationship. He tried to show that Ewald's muscular tonus property is under the influence of acoustic impressions. To prove it, he described rhythm and musical sensations in man, and explained through them why we derive different impressions on hearing music played either rapidly or slowly on an organ. The cause of both the psychic and the physical effect produced by music must be traced to the anatomic relation between the static and the acoustic labyrinth. There is as close a relationship between the nerves that traverse the two, as among their respective original nuclei. Tone, rhythm, harmony and melody were discussed by the lecturer. He charmed the audience with his description of how rhythm, by stirring the static labyrinth, favors muscular tonus. He recalled that even among the deaf, who receive only subjective sensations, muscular tonus is superior to that possessed by those who cannot hear any sound at all. The oldest musical instrument, the drum, according to Neumann, was originally just a mortar covered with skin, the rhythm of work fusing with the rhythm of music. At the beginning, music, song and dance were inseparable, their exciting influence being so marked that primitive races, and later savages, danced and sang to certain simple but rhythmic tunes exacting such muscular effort as to tire them out.

2. PERIPHERAL NERVES.

Pitres and Marchand. PSEUDOTABES. [Progrès Médical, XXXVII, No. 34.]

This rather unusual evolution of a polyneuritis after mumps occurred in a young soldier of twenty. Violent pains and paralysis of all the limbs marked the onset of the multiple neuritis. The paralysis soon disap-

peared, but on getting up it was noted that the gait was impaired by paresis and motor incoördination.

Comby, J. HERPES ZOSTER IN CHILDREN. [Bull. Soc. Méd. d. Hôp., Vol. XLVI, No. 23, p. 992.]

This pediatricist collects the histories of eighty-four cases of herpes zoster occurring in children between the ages of eight months and fifteen years. In none could he trace any connection with chicken pox. The tuberculin test was positive in eighteen of twenty-five cases tested. In two cases the herpes was bilateral. In thirty-seven cases it was located in the chest dermatomeres, and on the head and neck in seven.

Serra, G., and Ferraro, A. SURGERY OF SPINAL NERVE ROOTS. [Chirurgia degli Organi di Movimento, Vol. VI, No. 3-4, p. 363; J. A. M. A.]

This illustrated communication from two of the institutes of the University of Sassari presents evidence that it is possible and feasible, in dogs, to join the peripheral stump of a spinal nerve root with the central stump of the spinal nerve root just above. Three nerve roots were thus transplanted in a series, the upper one thus restoring motor function to a leg previously paralyzed by severing the nerve root or severing the spinal cord. Serra and Ferraro are convinced that these experiments justify the hope of analogous successful intervention in clinical cases of paralysis from spinal cord lesions.

Barré, J. A., et Gunsett, A. RADIOTHERAPY IN ARTHRITIC RADICULITIS. [J. de radiol. et d'électrol., V, 492; Med. Sc.]

Radiological examination shows osseous or articular lesions very frequently in cases of radiculitis of the lower extremity. The twenty cases are divided into three series: (1) Cases of complete cure manifested by the complete disappearance of painful symptoms: this includes twelve cases; (2) amelioration, less striking but distinct: this includes five cases; (3) cases which derived no benefit: this includes three cases. Short notes are given about each case. X-rays alone were used in treatment. The most favorable cases are those in which pain is the most marked sign: cases of meningeal origin do not appear to be influenced by radiotherapy. The duration of the disease does not seem to have much effect on the final result. In most cases a dose of 3 H. units filtered with 4 mm. of aluminium repeated every eight days is the best. In cases which do not respond to this treatment it is suggested that a dose of 10 H. units carefully applied might be used.

Graff. SURGICAL TREATMENT OF SCIATICA. [Beiträge zur klin. Chir., Vol. CXXVI, No. 1, Kümmell Festschrift, Second Half.]

This surgical paper reverts to an old method of stretching the sciatic. He exposes the nerve as it emerges and then stretches it gently. This has helped his cases invariably. Seventeen are reported. The fibers of

the nerve are not separated but merely loosened with his fingers. Bleeding should be avoided. The altering of the relations between the nerve and its environment is responsible for the benefit, rather than the stretching.

Spiegel, E. A. MEDULLARY SHEATHS IN WALLERIAN DEGENERATION. [Beitr. z. path. Anat. u. z. allg. Path., LXX, 215; Med. Sc.]

At the beginning of Wallerian degeneration the double refracting power of the medullary sheath undergoes an at first reversible and then unreversible weakening. The cause of this change is to be found in the diminished surface tension of the axoplasm and in the consequent tendency of the myelin to assume convex shapes. This leads to a swollen condition which precedes the degeneration (in the ordinary sense) of medullary sheaths. These observations, and in particular the moderate swelling of degenerating nerves, explain why, in affections of the central nervous system associated with an acute degeneration of the nerve substance, the brain may be characteristically swollen. [C. da Fano.]

Ohomori, K., Ohhashi, Y., Nakanichi, H., Hara, M., and Ota, T. ETIOLOGY OF BERIBERI. [Japan Medical World, Vol. II, No. 5, p. 128.]

This paper tends to demonstrate that beriberi is produced in healthy men when food deficient in vitamin B is used. They claim it to be established that beriberi is avitaminosis. Supplying vitamin B without other change in diet will cure it.

Taguchi, K., Hiraishi, S., and Kiva, F. EXPERIMENTAL POLISHED RICE DISEASES IN HUMAN. [Japan Medical World, Vol. II, No. 5, p. 133.]

For years the use of polished rice was claimed to be the cause of beriberi. Now these authors claim that beriberi and human polished rice disease are different diseases, although clinically they are indistinguishable.

N. B.—All business communications should be made to Journal of Nervous and Mental Disease, 64 West 56th St., New York.

All editorial communications should be made to Dr. Smith Ely Jelliffe, Managing Editor, 64 West 56th St., New York.

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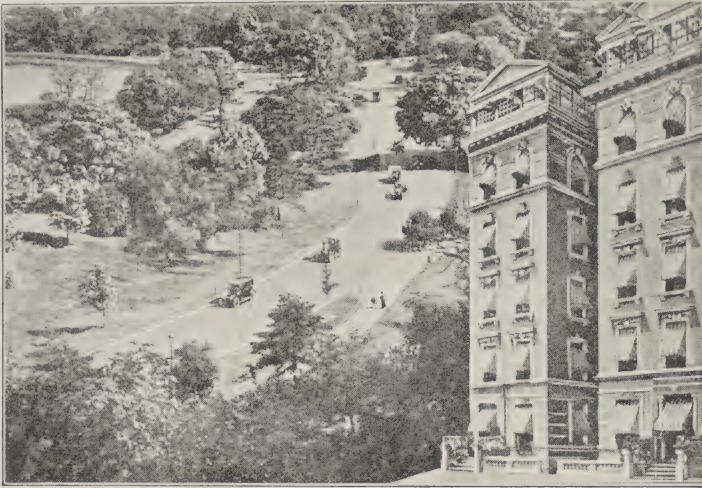
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